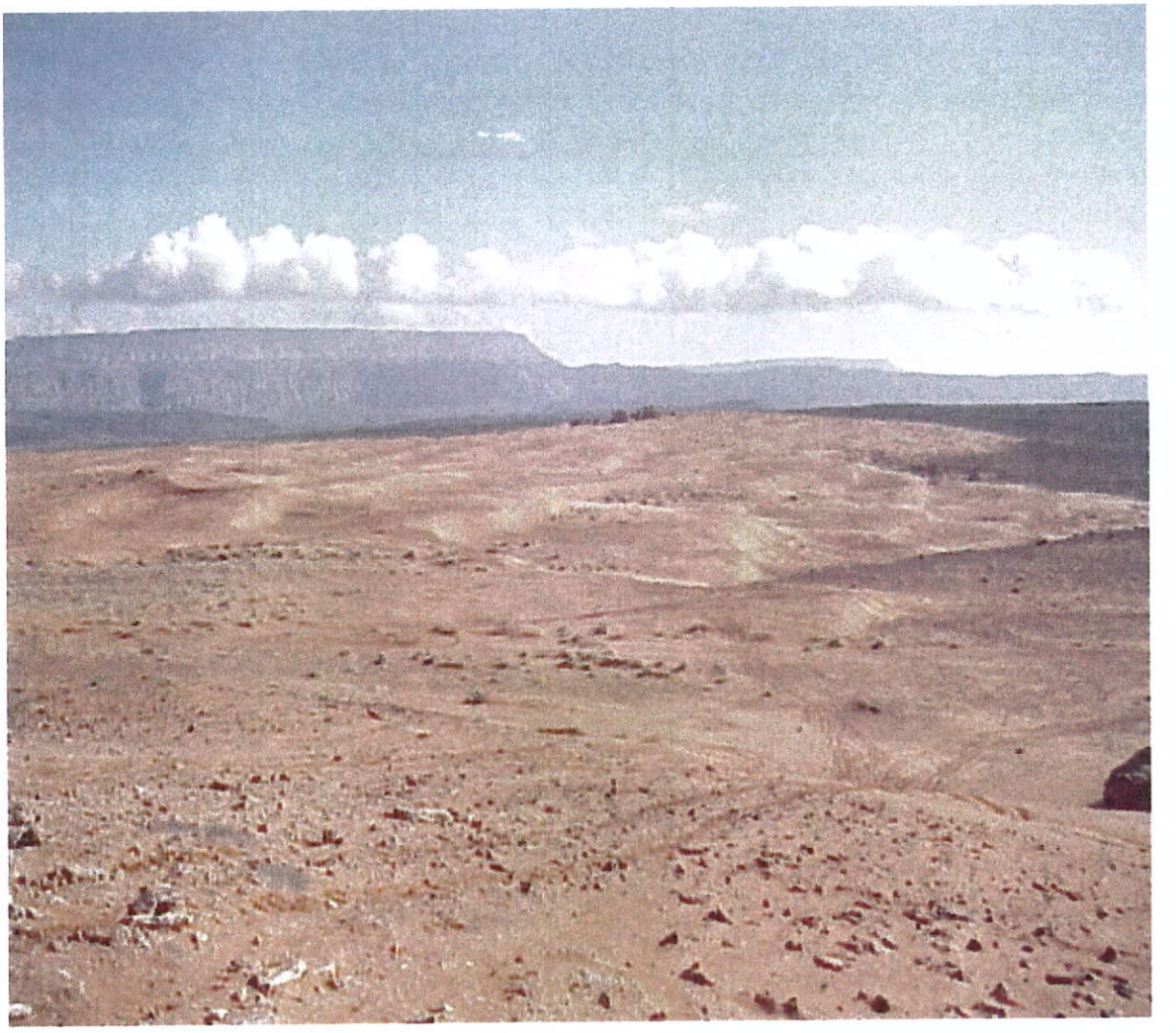
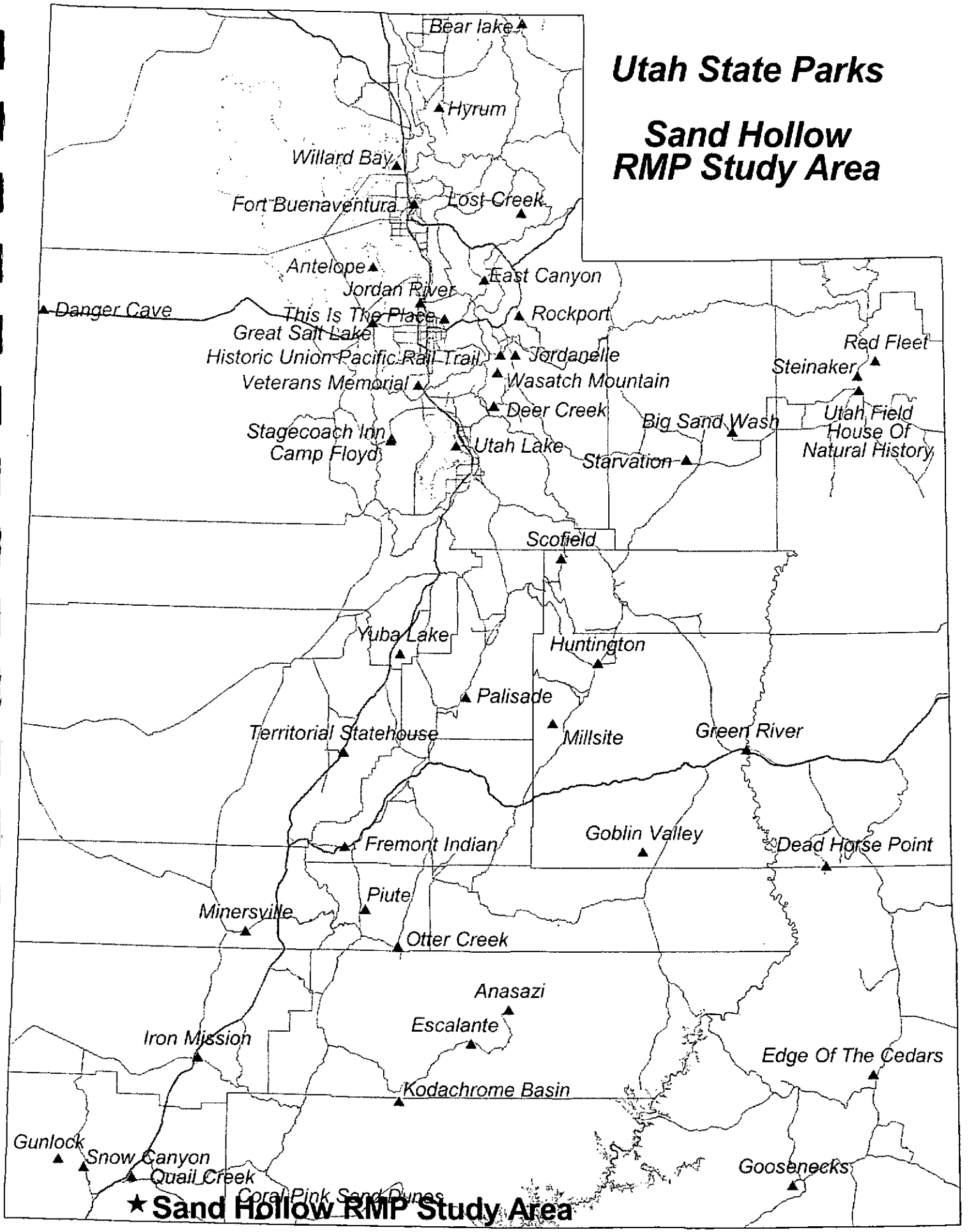
Sand Hollow Recreation Area



Recreation Management Plan

MAY 2001


Utah State Parks
Sand Hollow
RMP Study Area
Bear lake
Hyrum
Willard Bay
Fort Buenaventura
Lost Creek
Antelope
East Canyon
Jordan River
Danger Cave
This Is The Place
Rockport
Great Salt Lake
Historic Union Pacific Rail Trail
Jordanelle
Red Fleet
Steinaker
Veterans Memorial
Wasatch Mountain
Deer Creek
Big Sand Wash
Utah Field House Of Natural History
Stagecoach Inn
Camp Floyd
Utah Lake
Starvation
Scofield
Yuba Lake
Huntington
Palisade
Territorial Statehouse
Millsite
Green River
Goblin Valley
Fremont Indian
Dead Horse Point
Piute
Minersville
Otter Creek
Anasazi
Escalante
Iron Mission
Edge Of The Cedars
Kodachrome Basin
Gunlock
Snow Canyon
Quail Creek
Coral Pink Sand Dunes
Goosenecks
★ Sand Hollow RMP Study Area

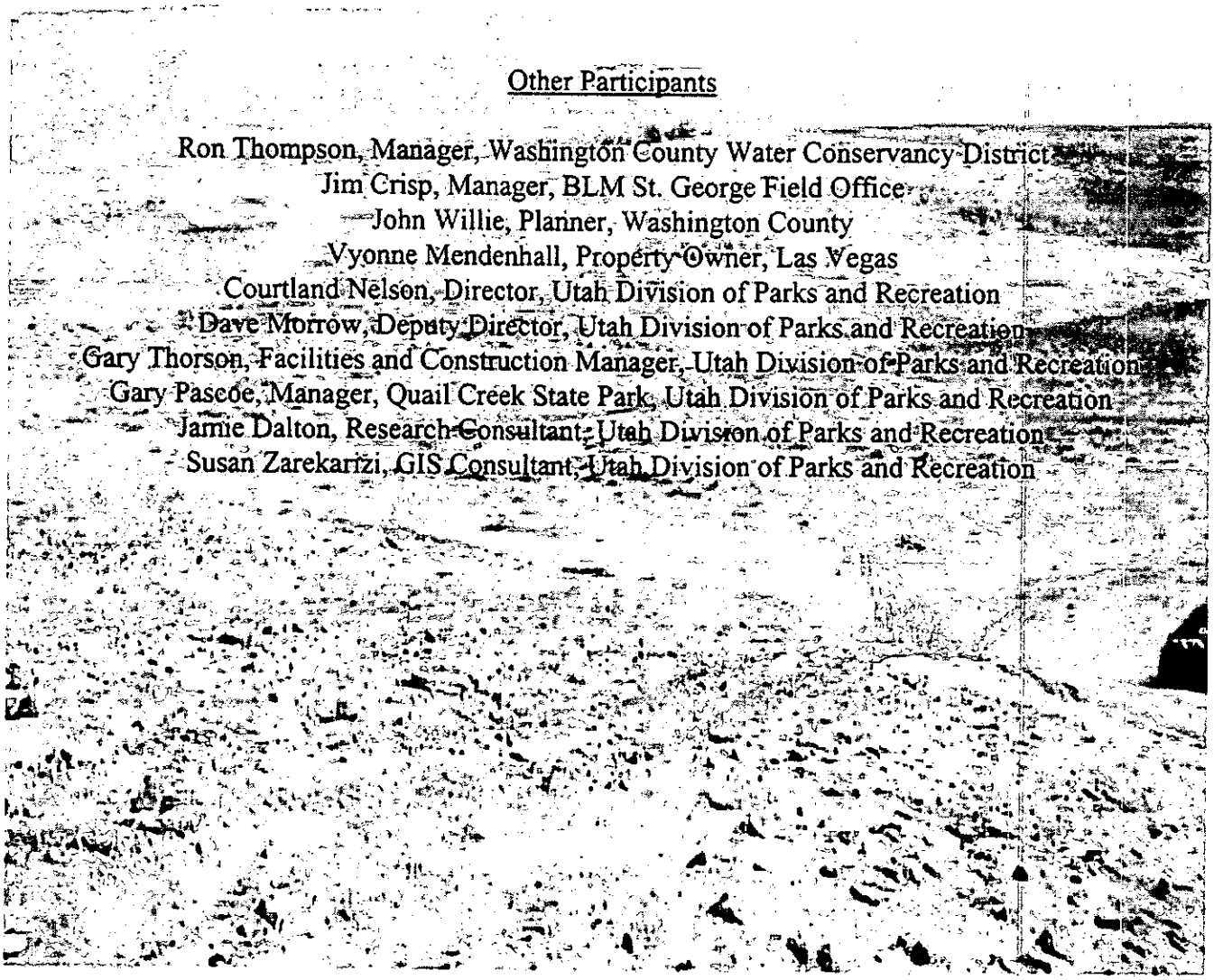
ACKNOWLEDGMENTS

Sand Hollow Recreation Management Planning Team

Randy Frei, Water Sports Representative, Santa Clara
Dale Grange, High Desert Trails, Hurricane
Annette Hirshi-Boden, Back Country Horsemen, Dammeron Valley
Barbara Hjelle, Washington County Water Conservancy District, St. George
C. Jack Lemmon, Washington County Water Conservancy District, St. George
Hugh Pauls, Back Country Horsemen, Dammeron Valley
Dave Sanders, Hurricane City Council, Hurricane
Sheriff Kirk Smith, Washington County Sheriff's Office, St. George
Gordon Topham, Regional Manager, Utah Division of Parks and Recreation

Other Participants

Ron Thompson, Manager, Washington County Water Conservancy District
Jim Crisp, Manager, BLM St. George Field Office
John Willie, Planner, Washington County
Vyonne Mendenhall, Property Owner, Las Vegas
Courtland Nelson, Director, Utah Division of Parks and Recreation
Dave Morrow, Deputy Director, Utah Division of Parks and Recreation
Gary Thorson, Facilities and Construction Manager, Utah Division of Parks and Recreation
Gary Pascoe, Manager, Quail Creek State Park, Utah Division of Parks and Recreation
Jamie Dalton, Research Consultant, Utah Divisron of Parks and Recreation
Susan Zarekarizi, GIS Consultant, Utah Division of Parks and Recreation



I. INTRODUCTION

A. ACKNOWLEDGMENTS

Sand Hollow Recreation Management Planning Team

Randy Frei, Water Sports Representative, Santa Clara
Dale Grange, High Desert Trails, Hurricane
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Jamie Dalton, Research Consultant, Utah Division of Parks and Recreation
Susan Zarekarizi, GIS Consultant, Utah Division of Parks and Recreation

PREFACE

The Sand Hollow Recreation Area has the potential to be one of Utah's most unique recreation areas. Several attributes set Sand Hollow apart from other recreation areas. It is the only State Park that accommodates such a broad-base of recreational use: water-based recreation, off-highway vehicle use, equestrian activities, hiking, biking and camping, among others.

Secondly, the park will be managed in a truly cooperative fashion. The Utah Division of Parks and Recreation will manage the area in partnership with the Bureau of Land Management and the Washington County Water Conservancy District.

The park will be linked to other recreational opportunities with the greater Washington County area. As a consequence, not only does the park have the potential to become a major destination point, it will likely establish itself as the predominant recreation area in the rapidly growing St. George area. Its establishment will thus serve as a buffer to urban growth and help ensure that Washington County retains unique recreational opportunities that enhance residents' quality of life.

Finally, the park's vast land base - approximately 21,000 acres - provides visitors not only with a wide range of activities, but will allow them to experience unparalleled scenic beauty as they recreate within uncrowded and clean surroundings.

Cooperative planning for such an outstanding recreational asset is essential to ensure that state, local, federal and private funds are efficiently and effectively allocated to meet the recreating public's demands. It is also necessary for the long-term protection and public enjoyment of Sand Hollow's facilities and its unique resources.

This **Recreation Management Plan (RMP)** is required by the park's managing partners - the Utah Division of Parks and Recreation, The Washington County Water Conservancy District and the federal Bureau of Land Management and their respective governing boards or authorities - to guide short and long term site management and capital development. The planning process recommends necessary actions and a future vision for the park. Specifically, the process: **(1) recognizes impacts will result from use and enjoyment of the site; (2) identifies the various recreational activities, policies, programs and facilities while providing reasonable protection of the resources for future visitors; (3) seeks sustained quality and value; and (4) seeks to determine the conditions under which this can be attained.**

A Sand Hollow Recreation Management Team, consisting of community leaders, potential recreationists, local residents and agency representatives, was formed to develop a vision for the park, identify issues, and provide managerial recommendations. The team developed a future vision to guide management actions at Sand Hollow. Under this vision, it was determined that all activities should:

- Provide for clean, easily accessible facilities, areas and programs accommodating a broad range of use;

- Develop well-designed, well-maintained facilities that minimize congestion and user conflict;

- Ensure that development enhances the area's aesthetic and scenic values and is consistent with adjacent land use;

- Enhance visitor knowledge of the park's recreational opportunities, its resources, and safety issues;

- Provide appropriate private concession opportunities;

- Secure a professional, friendly customer service-oriented staff.

Team recommendations were reached by consensus and included input from the public and other government agencies. These recommendations will guide management of the area over the next several years. They are intended to be dynamic and will evolve concurrently with park and local community development and as individual portions of the vision statement are achieved.

Recommendations contained within the plan will be implemented under the direction of the Washington County Water Conservancy District, the Bureau of Land Management and the Utah Division of Parks and Recreation. This plan is intended to be a useful, workable document that will guide management of the park into the 21st century.

LIST OF FIGURES, TABLES AND MAPS

FIGURES

TABLES

MAPS

TABLE OF CONTENTS

APPENDICES

EXECUTIVE SUMMARY

In October, 2000 representatives from the Washington County Water Conservancy District (Water District), the Utah Division of Parks and Recreation (State Parks) and the Bureau of Land Management's St. George Field Office (BLM) met with community stakeholders from the Washington County area to initiate a recreation planning effort for the proposed Sand Hollow Recreation Area. The goal was to develop a plan identifying necessary recreational activities, programs and facilities effectively linking the Water District's 4,047 acre Sand Hollow reservoir site with over 16,500 acres of the BLM's Sand Mountain recreation area. This linkup resulted in the creation of the Sand Hollow Recreation Area, a recreational site that is poised to become a prime destination area for water-based recreation, off-highway vehicle enthusiasts, equestrian users, and campers.

Management of the area will occur under a cooperative arrangement with the Water District, State Parks and the BLM. The involvement of these three managing partners represents a cooperative effort that draws upon the expertise and resources of each agency. Moreover, since the Water District and BLM are the primary landowners, it is imperative that they play an active role in developing and managing recreation activities within the proposed area.

The Sand Hollow Recreation Management Planning Team - a citizen-based team - was at the core of the process. The team includes local boaters, motorized and non-motorized trail users, local law enforcement officials and representatives from Hurricane City, the Washington County Water Conservancy District and the Utah Division of Parks and Recreation.

The planning process was based on public input and involvement. The recommendations contained in this document represent several months of work by the team as well as direct public input. Moreover, this recreation plan is an extension of two comprehensive resource management plans: the BLM's St. George Field Office Record of Decision and Resource Management Plan released in 1999; and the Water District's Sand Hollow Reservoir Project Report issued in 1997. These two plans provide an inventory of area resources, define resource

protection strategies and recommend appropriate recreation activities for the area. These documents form the regulatory baseline for recommended actions. Proposed activities are consistent with and supportive of these earlier plans.

The plan provides recommendations which are founded upon six primary vision elements that will guide future management of the Sand Hollow Recreation Area. These elements focus on:

- Providing for clean, easily accessible facilities, areas and programs accommodating a broad range of use;
- Developing well-designed, well-maintained facilities that minimize congestion and user conflict;
- Ensuring that development enhances the area's aesthetic and scenic values and is consistent with adjacent land use;
- Enhancing visitor knowledge of the park's recreational opportunities, its resources, and safety issues;
- Providing appropriate private concession opportunities;
- Securing a professional, friendly customer service-oriented staff.

These elements are geared toward providing visitors with a broad array of safe and enjoyable recreation experiences in a clean, well-designed and well-organized atmosphere. Achievement of these vision elements will require the continued support of users, community leaders and the area's managing partners.

The planning team recommended the Sand Hollow Recreation Area be included in the state park system under the auspices of the Utah Division of Parks and Recreation. As with nearby Quail Creek State Park, the Washington County Water Conservancy District will be the "property owners" while State Parks will be responsible for day-to-day management of developed recreation at Sand Hollow Reservoir. While State Parks will assume responsibilities for management of developed recreation areas and facilities, they will assist BLM's St. George Field

Office with its primary responsibility of managing dispersed recreation activities in the park's 16,564 acre Sand Mountain parcel. BLM will be responsible for development actions that occur on Sand Mountain.

Under this managing partnership, the planning team issued several specific recommendations in support of the plan's vision elements. Six recreation issue areas form the basis of the team's recommendations:

- **SURFACE BOATING AND PERSONAL WATERCRAFT (PWC)**
- **NON-MOTORIZED RECREATION**
- **MOTORIZED RECREATION**
- **FISHING AND WILDLIFE RECREATION**
- **OPERATIONS MANAGEMENT**
- **FACILITIES DEVELOPMENT**

Implementing recommendations will be dependent upon acquiring new funding sources. There may be keen competition for funding or other unforeseen priorities and contingencies that could affect implementation.

The plan's success is dependent upon the continued support of area stakeholders, users and managing agencies. Efforts must be made to preserve park resources, interact with local communities and strive to meet the expectations of park visitors. The recommendations contained within this plan were based upon an open and collaborative process. It is imperative that this collaborative spirit continue as the plan's components are implemented.

MISSION STATEMENT

Mission Statement:

The mission of the Sand Hollow State Recreation Area is to provide visitors a wide variety of safe, accessible, educational and satisfying recreational experiences, develop facilities that meet user needs and enhance the area's aesthetic values while minimizing conflict and congestion, and secure a professional staff that will provide superior customer service.

Team members developed the mission statement on the premise that Sand Hollow is a unique site for recreation that has the potential to offer visitors a wide variety of uses with minimal conflict or congestion. The area is distinctive since it has a sufficient land and water base to accommodate water-related recreation, day-use activities, camping, motorized recreation, non-motorized use and a number of other activities. Not only will it serve as a site for a growing local population, it will become a major destination point for visitors from outside of the area.

Vision Statement:

The future vision of the Sand Hollow Planning Team is to:

-Provide for clean, easily accessible facilities, areas and programs accommodating a wide array of diverse recreational opportunities, activities and events;

-Develop facilities that are well-designed, well-maintained and adequately meet the user's diverse recreation needs while minimizing congestion and user conflict;

-Ensure that development enhances the area's aesthetic and scenic values and is consistent with adjacent land use;

-Enhance visitor knowledge of the park's recreational opportunities, its resources, and safety issues;

-Provide private concession opportunities, where appropriate, to meet the needs of the various recreation users at the site;

-Ensure that park staff meets or exceeds visitor expectations by providing professional, friendly and helpful customer service

VISION STATEMENT

To ensure that recommendations are consistent with this broad mission, team members

developed a vision statement to provide more specific guidance. A vision statement is similar to a compass; it charts a destination, sets the team on the correct course of action, and it provides the means to determine how closely team recommendations will follow that charted course. The Vision Statement's objectives help ensure that the managing partners effectively capitalize upon Sand Hollow's unique attributes.

The team determined that facilities, recreation areas, and programs should be effectively developed to meet the various user needs. Team members also felt that facility design and program implementation should minimize potential user conflicts and protect area resources. To effectively carry out these objectives, recommendations are focused on enhancing visitor knowledge of area resources, activities and safety issues. These vision elements provide the foundation for recommendations to meet the various demands that will inevitably impact the Sand Hollow site.

RESOURCE MANAGEMENT PLAN PURPOSE AND PROCESS

Purpose of the Plan

This Recreation Management Plan is intended to provide guidance for Sand Hollow's Managing Partners - the Washington County Water Conservancy District, the Utah Division of Parks and Recreation and the Bureau of Land Management. The plan effectively defines the stewardship obligations of each managing agency.

Sand Hollow will become one of Utah's most visited recreation areas. Annual visitation rates of more than 500,000 people are possible within the first few years of operation. Moreover, Sand Hollow's vast 21,000 acre land base will accommodate a spectrum of diverse recreational use: water-based recreation, off-highway vehicle use, equestrian activities, hiking, biking and camping, among others. Finally, Sand Hollow's land owners - the Washington County Water Conservancy District and the Bureau of Land Management will need to manage their holdings in a cooperative fashion to effectively achieve the goals outlined in the plan. These factors dictate a need for an effective, coordinated planning effort to meet potential visitor demands.

The park is situated within easy visitor access of numerous state and national parks, monuments and recreation areas as well as national forests, wilderness areas, and other attractions. Sand Hollow will serve as a linkage to other recreational opportunities with the greater Washington County area. As a consequence, not only does the park have the potential to become a major destination area, it will likely establish itself as the predominant recreation area in the rapidly growing St. George area. Its establishment will thus serve as a buffer to urban growth and help ensure that Washington County retains unparalleled recreational opportunities that enhance residents' quality of life.

A number of issues ranging from facilities development and recreation management to staffing, operations and funding were identified by various sources including input from planning team members as well as the public-at-large through focus groups, public meetings and opinion

surveys. Team members developed recommendations for six issue areas: water-based recreation; non-motorized use, motorized recreation; operations management; and facilities development. This plan addresses each of these issue areas. It will provide flexible guidelines for the management and development of the park over the next 10 to 20 year period. More importantly, it will provide this direction on the foundation of continued public input and consensus of key stakeholders, working hand-in-hand with the Water District, State Parks and BLM.

The Planning Process

Planning for an outstanding recreational resource such as Sand Hollow is required for the protection of this unique area and to ensure the efficient and effective expenditure of state and private funds. It is necessary to determine the recreating public's needs, develop strategies for implementing facilities, programs and related policies and for the long-term protection and public enjoyment of the area's unique resources. Assuming that Sand Hollow will be designated a State Park, this Recreation Management Plan is required by the Utah State Legislature and the Board of the Utah Division of Parks and Recreation to guide short and long-term site management and capital development.

The process is based on input from potential users, area citizens and agency expertise. Issues and recommendations were gathered from a series of public meetings, opinion surveys and focus groups working as adjunct subcommittees to the Recreation Management Planning Team.

In September, 2000 the Washington County Water Conservancy District requested the assistance of the Utah Division of State Parks in developing a Recreation Management Plan for the new Sand Hollow reservoir. State Parks agreed to facilitate the development of a Recreation Management Plan to help determine needed facilities, programs, activities, policies, equipment and required staff for the proposed site.

In October 2000, the Washington County Water Conservancy District hosted a luncheon for community stakeholders to familiarize them with the proposed process and illustrate the need for

creating a plan to guide recreation development at the Sand Hollow Reservoir site. During this meeting stakeholders were asked to identify community members and various users with an interest and expertise in the proposed park to serve as members of a Recreation Management Planning Team. Team members were selected for their technical expertise in a specific area such as recreation, public safety or public administration. All team members participated on a voluntary basis and expressed a willingness to sacrifice a significant portion of their time and expertise to the process. Eight individuals were selected to serve on the planning team and three representatives from the Division served as staff to the team.

Public Input

In addition to the representative, citizen-based characteristics of the planning team, it was determined that direct public input and involvement would be essential to develop recommendations that are in step with user needs. Opportunities for the public to provide input have been extensive. First, adjunct subcommittees consisting of representatives from various citizen user groups and agency officials were selected to help develop issues and recommendations for five issue areas: facilities development; non-motorized use; motorized use; fisheries and wildlife recreation; and operations management. Secondly, the public was invited to provide comment and feedback regarding Sand Hollow in two public meetings in the St. George area: at the January, 2001 Parks and Recreation Board Meeting; and at a February, 2001 public scoping meeting. An opinion survey was also developed to elicit public input. Finally, copies of this document will be submitted for public review and comment.

Results of Public Scoping Meeting

A public meeting was held in St. George on February 8, 2001 to inform the public about the planning process and more importantly, to gather input on the types of activities and facilities that need to be included in the proposed planning area. Each participating individual was asked to provide answers to the following questions:

- *What are the most important recreational **activities** that should be provided at the **Sand Hollow Reservoir** Site?*

- *What are the most important recreational **activities** that should be provided on the adjoining **Sand Mountain** Area?*
- *What are the most important recreational **facilities** that should be provided at the **Sand Hollow Reservoir** Site?*
- *What are the most important recreational **facilities** that should be provided on the adjoining **Sand Mountain** Area?*

Upon compilation of individual responses, meeting participants were then asked to rank them in order of importance. To do this, participants were allowed to cast "votes" on what they thought were the most important responses under each category. Results of this ranking process are summarized in figure 1 below.

▸ ***Preferred Reservoir Activities***

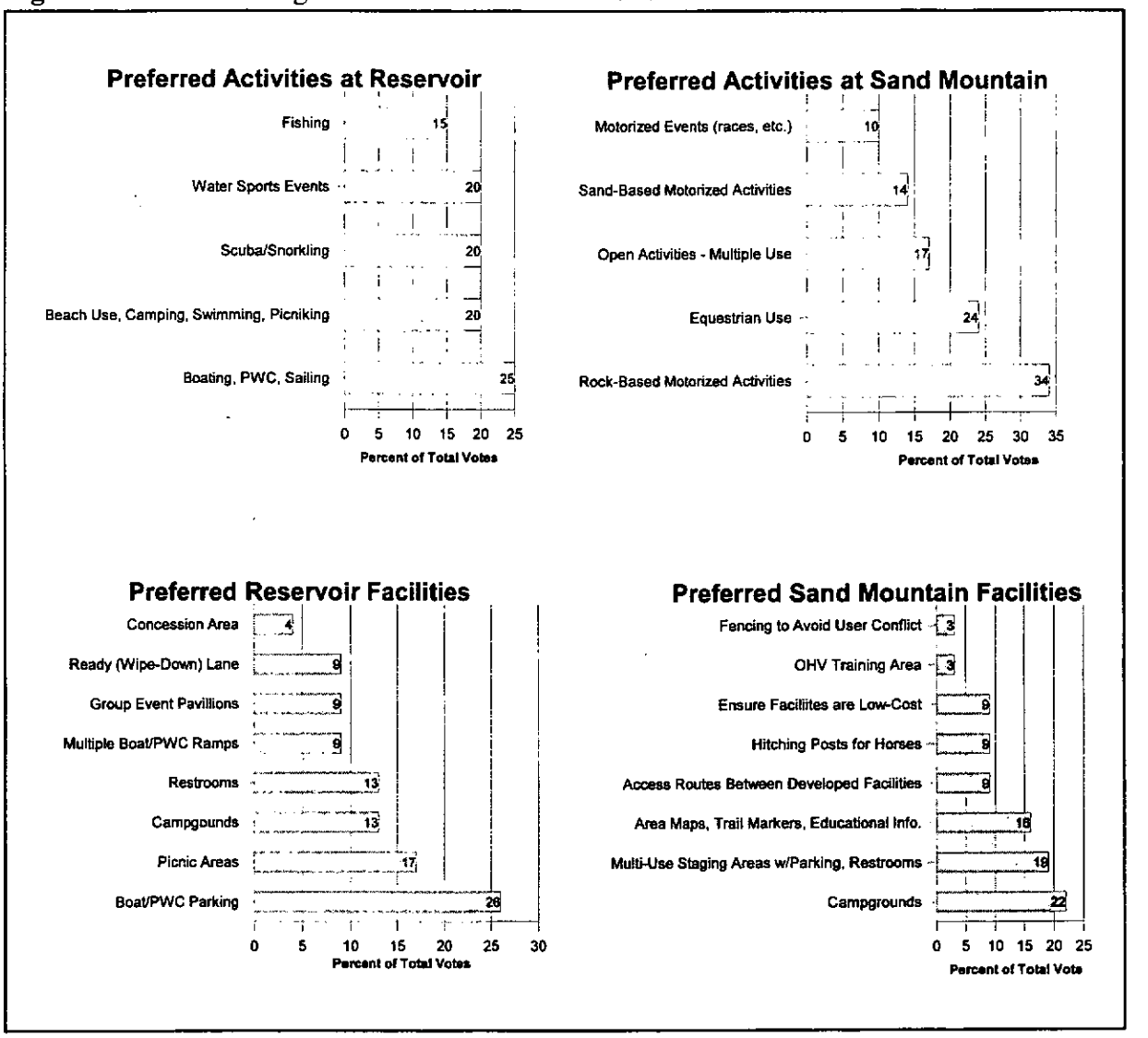
As figure 1 indicates, meeting participants ranked the listed preferred reservoir activities on a fairly equal basis. Participants noted that boating, personal watercraft (PWC) use and sailing were the most important recreational activities that should be provided at the reservoir. This was closely followed by beach use and related activities such as swimming and picnicking. Camping was equally as important as was an expressed preference for unique activities such as scuba-diving and snorkling. Participants also expressed a preference for water-related events (such as waterski competitions or boat racing, for example). Finally, fishing - although ranked last - was still a close competitor in preferred reservoir activities.

▸ ***Preferred Sand Mountain Activities***

Rock-based motorized activities (trials motorcycle activities, four-wheel drive "rock crawling", etc.) received the majority of votes as a preferred Sand Mountain recreational activity. Equestrian (horseback riding) use was next in line receiving approximately one-quarter of

participant votes. This was followed by a general preference - open activities/multiple use -

Figure 1: Public Meeting Results - Preferred Activities and Facilities



where participants felt that the BLM's "open" designation of diverse motorized and non-motorized uses on Sand Mountain should remain in effect. Sand-based motorized activities (e.g., dune riding for off-road vehicles [ORVs]) received about 14 percent of the total votes cast. Finally, about 10 percent of the votes were cast in favor of seeing motorized events - races, competition, etc., - occur in the area. Participants also listed hiking, rock climbing and other miscellaneous activities as potential Sand Mountain events. However, none of these activities

received a "vote" from meeting participants.

- ***Preferred Reservoir Facilities***

Team members voted boat and PWC parking as the reservoir area's most needed facility. This was followed by picnic areas, campgrounds, and restrooms in descending order of preference. Next in order of preference, the group also saw a need for multiple boat/PWC ramps, group pavilions to view water-based events and a "ready lane" that allows boaters to clean and wipe-down their boats after use. Finally, participants felt that a concession area should be provided. Reservoir facilities discussed but not receiving any votes included an entrance station, trash collection service, a first aid station, a golf course and a fish cleaning station.

- ***Preferred Sand Mountain Facilities***

Camping dominated the list of facilities preferred for the Sand Mountain area. The group noted that campground development should accommodate multiple uses such as motorized, equestrian and other non-motorized users. Next, in order of preference were staging/parking areas that will allow motorized and non-motorized (primarily equestrian) users to access Sand Mountain. Participants felt these areas should include trash collection and restrooms if possible. Information about Sand Mountain - maps, trail markers and educational information - was next on the priority list. While not a "facility," the group felt that such information is needed and should be provided at or near staging areas or campgrounds. The next three preferred items on the list - hitching posts for horses, provision of access routes between the reservoir and Sand Mountain and development of low-cost facilities were weighted equally. Clearly, the latter item - low-cost facilities - is a conceptual preference. Finally, the group placed equal weight on the need for an OHV training area on Sand Mountain and area fencing - where appropriate - to delineate boundaries and inhibit user conflict. Two other needs: signs to prohibit shooting in adjacent areas and a motocross track were discussed as potential Sand Mountain facilities. However, they received no participant vote.

ABOUT SAND HOLLOW

The area that constitutes Sand Hollow Recreation Area is host to a wide variety of different uses and activities. The area has long been used for grazing, motorized and non-motorized recreation, undeveloped camping and sightseeing, among other uses. With the development of the Sand Hollow Reservoir, the area will add culinary water storage, private development and water-based recreation to its long list of diverse uses. This section briefly describes the physical setting, climate, and geographical boundaries of the Sand Hollow Recreation Area. It also provides background information on the proposed area's two major components: Sand Hollow Reservoir and Sand Mountain.

Physical Setting

The Sand Hollow Recreation Area is located in southwest Utah approximately fifteen miles east of St. George off State Highway 9. The proposed area will cover approximately 20,500 acres and will include a large portion of the nearby Sand Mountain. The area is noted by its dry, warm desert environment. Sand Mountain will provide visitors with opportunities to recreate in the midst of southwest Utah's noted scenic beauty: reddish-orange dune fields and red cliffs. From Sand Mountain, visitors will be able to experience spectacular scenic views of the Pine Valley Mountains and the Colorado Plateau to the north, Zion National Park to the east and the Arizona Strip to the west.

In addition to water-based recreation, the area will offer excellent opportunities for off-highway vehicle use, horseback riding, hiking, and photography. Moreover, the area is a virtual hub to numerous other recreational opportunities. Zion National Park, Cedar Breaks and Pipe Springs National Monuments, Quail Creek, Snow Canyon, Gunlock, Coral Pink Sand Dunes and Iron Mission State Parks all lie within a 60 mile radius of the area.

Climate

The Sand Hollow Recreation Area is located in a warm, semi-arid high desert environment marked by low precipitation, a wide daily temperature range, high summer temperatures and mild

winters. Average maximum daytime temperatures during the summer months are among the highest in the state. On average, maximum daytime temperatures exceed 92 degrees from June through September. Daily maximums for July average about 100 degrees. Average minimum temperatures range from about 66 degrees in the summer to about 26 degrees in winter. Average annual precipitation is just above 8 inches per year.

Most precipitation occurs between January and March. While occasional snowfall does occur in the area during the winter, it rarely stays on the ground for an extended period of time. Monsoonal flow in late summer brings brief but heavy thunderstorms to the area. These intense storms often result in local flash flooding.

Wind, blowing dust, lightning and high temperatures may pose threats to Sand Hollow visitors. Southerly winds preceding a frontal system cause blowing sand and dust. Post-frontal winds funneled down from Black Ridge canyon to the north may exceed 50 mph. High micro-burst winds accompanying summer thunderstorms may also be of concern to area users. More importantly, intense lightning may be a hazard - especially on Sand Mountain's exposed ridge areas. Finally, during the hot summer months, ground temperatures may exceed 150 degrees. Rock formations - volcanic in particular - absorb tremendous amounts of heat. Such high ambient temperatures present potential health risks.

Determination of Area's Geographical Boundaries

The planning team consulted with both the BLM's St. George Field Office and the Washington County Water Conservancy District to review land ownership and geographical characteristics of the area. From this review, the team outlined a planning boundary for the proposed Sand Hollow Recreation Area that would include approximately 16,564 acres of the 40,725 acre Sand Mountain Special Recreation Management Area (SRMA) currently operated by the BLM as well as the 4,047 acre area owned by the Washington County Water Conservancy District that includes Sand Hollow Reservoir (see Plate 1: *Planning Boundary*).

It was determined that the designated boundary follow the existing ridge lines of Sand Mountain's western, southwestern and southern boundaries. The boundary runs eastward bordering a section of School and Institutional Trust Lands Administration (SITLA) land and intersects private lands in the northeast corner. The northern boundary coincides with the District-owned property on the northeast, north and northwest corners until it intersects BLM lands near the foot of Sand Mountain's northwestern boundary. The group designated this boundary on the following considerations:

- Utilize area terrain (e.g., ridge lines, natural contours, etc.) that will provide users with a more "natural"/logical boundary;
- The designated area is commonly used by OHV enthusiasts and others and would therefore be more "familiar" to many users;
- Law enforcement, search and rescue efforts will be easier since the park boundary will stop on ridge lines and will not include the precipitous slopes and cliffs that exist on the park's southeast boundary (it should be noted that recreational activities may occur beyond these boundaries, but will likely not be included in the range of opportunities found "within the park");
- Confining recreational activities to the ridge lines will help minimize human contact with known raptor sites that occur on the park's southeastern cliffs;
- The designated boundary will help prevent trespass, particularly on SITLA properties within the adjacent Warner Valley area;
- The boundary will also help avoid disturbance on known archeological sites above the area's northwestern portion.

Sand Hollow Reservoir

From a recreational perspective, Sand Hollow Reservoir is poised to become the hub of water-based recreation in Washington County. Once completed, Sand Hollow will become the County's largest body of water. Location (close proximity to populated areas), amenable climate, easy access and proximity to other recreation opportunities will likely make Sand Hollow

Reservoir one of the most visited recreation areas in the state.

Construction of the Sand Hollow Reservoir facility was initiated in June 2000. The project was originally conceived in the early 1990s as an additional storage reservoir for the Quail Creek system. A land exchange bill passed by Congress in 1996 authorized the Washington County Water Conservancy District to acquire the 4,047 acre site by trading a parcel of its own property (adjacent to Zion National Park) to the Bureau of Land Management in exchange. A subsequent environmental assessment was conducted to evaluate impacts on area resources including proposed archeological protection and species recovery measures for the acquired property. The assessments found no negative effects that cannot be adequately mitigated by the District during construction and operation of the reservoir.[1]

The reservoir will consist of two earthen dams, one placed on the north end of the reservoir, the other located on the west end. When completed, the northern dam will have a maximum height of about 97 feet and a total length of 3,000 feet. The west dam will be considerably larger - about 7,500 feet in length and a maximum height of 57 feet. Since Sand Hollow's dams do not lay astride an active river or stream, water to fill the reservoir will be pumped via aqueduct from the nearby Virgin River through the existing Quail Creek Diversion. The pipeline will have the capability to send water both directions between the Sand Hollow and Quail Creek reservoir. The District will fill Sand Hollow reservoir during periods of increased flow in the Virgin River between mid-October and mid to late April, and then release water back into the Quail Creek system during the remainder of the year. The project is scheduled to be completed in early fall 2001. Water District officials note it could take from three to five years to fill the reservoir.

The reservoir basin formed by the two dams will have a maximum capacity of about 28,000 acre feet, and will cover a surface area of approximately 1,324 surface acres (see Plate 2: *Sand Hollow*

[1] Greystone Environmental Planning. (1997). Sand Hollow Reservoir Project Report. (Environmental Assessment prepared for the Washington County Water Conservancy District), pp 4-1, 4-2.

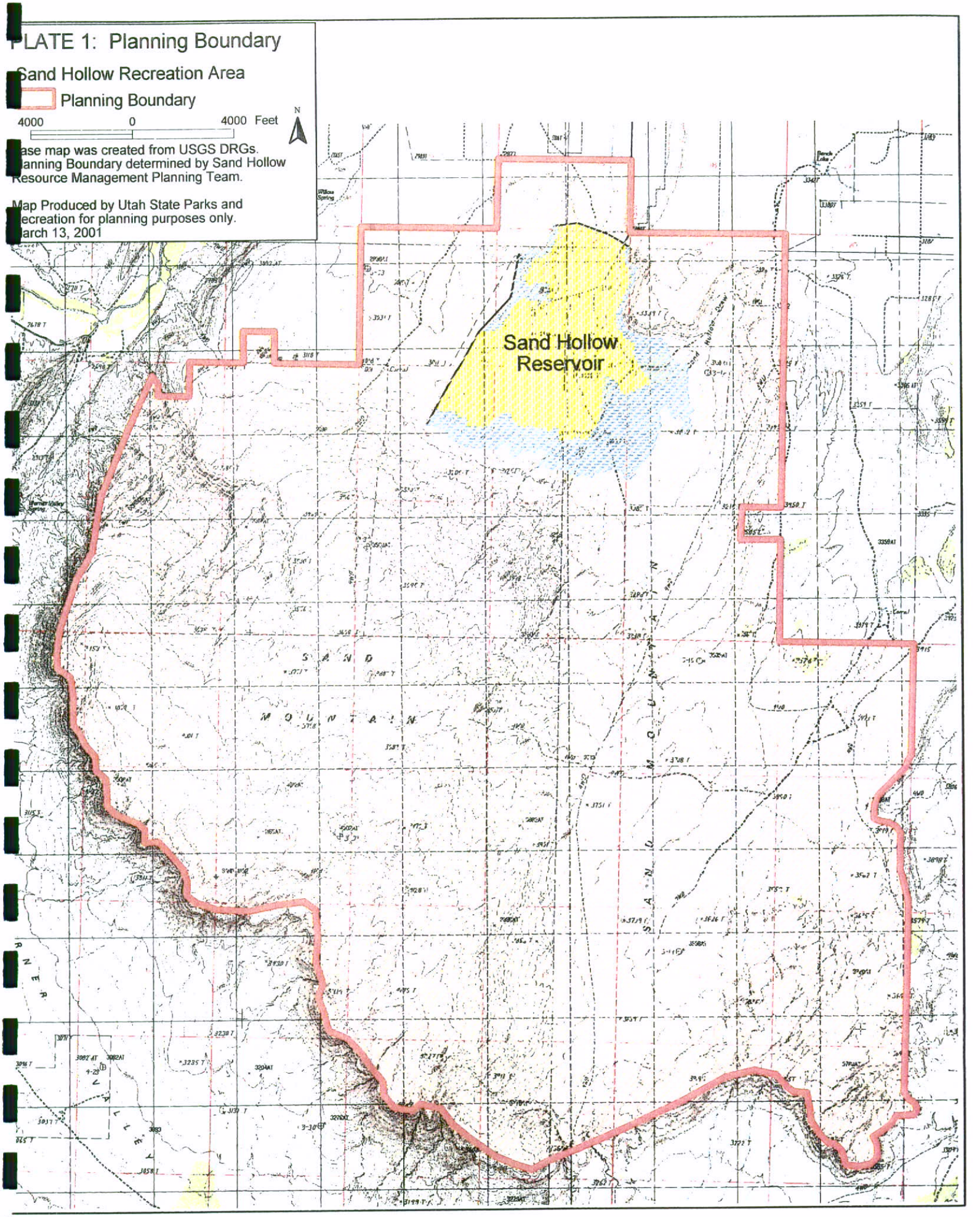


PLATE 1: Planning Boundary
Sand Hollow Recreation Area
Planning Boundary
4000 0 4000 Feet
N
ase map was created from USGS DRGs.
anning Boundary determined by Sand Hollow
Resource Management Planning Team.
Map Produced by Utah State Parks and
ecreation for planning purposes only.
arch 13, 2001
Sand Hollow
Reservoir
S A N D
M O U N T A I N

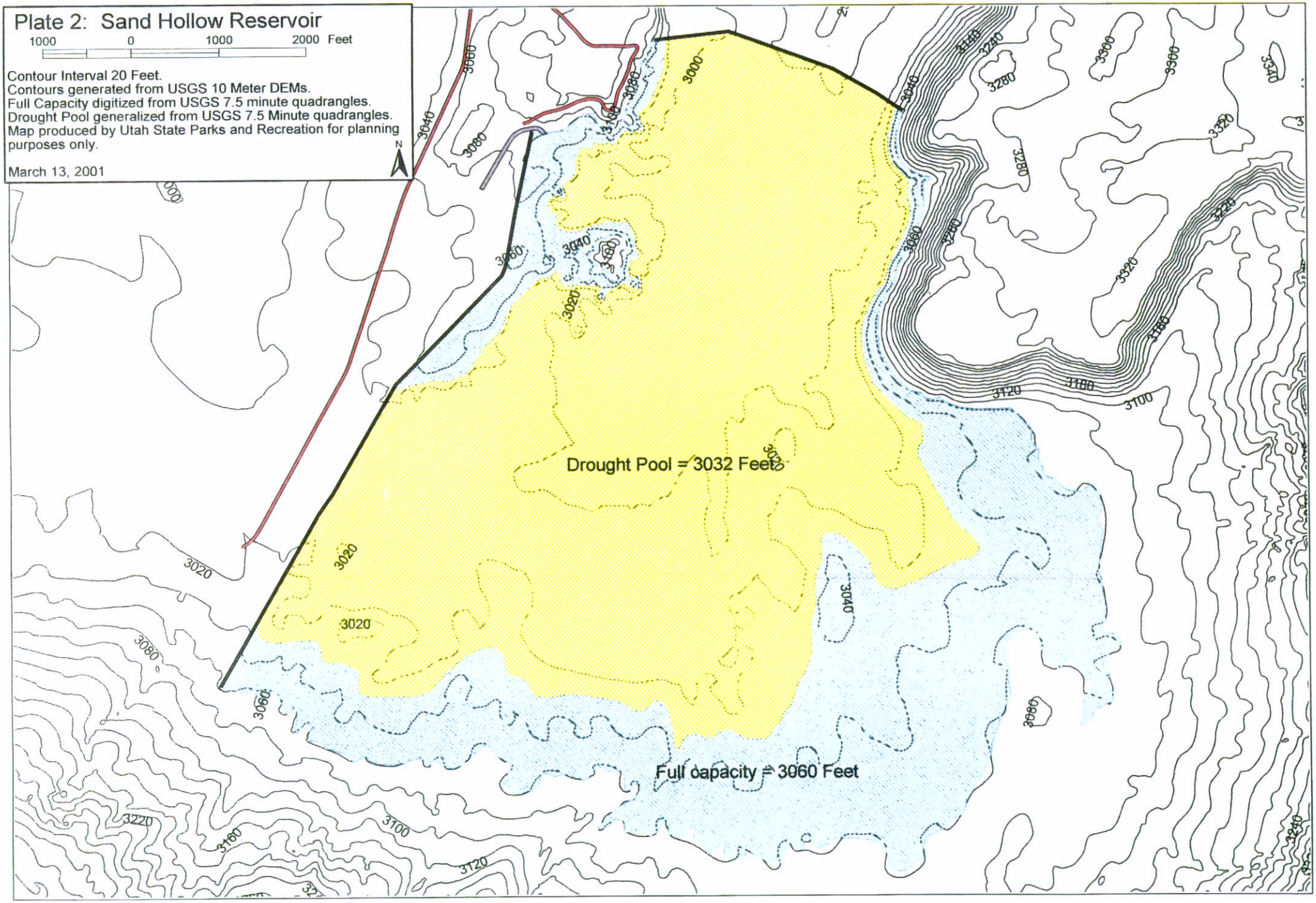


Plate 2: Sand Hollow Reservoir
1000 0 1000 2000 Feet
Contour Interval 20 Feet.
Contours generated from USGS 10 Meter DEMs.
Full Capacity digitized from USGS 7.5 minute quadrangles.
Drought Pool generalized from USGS 7.5 Minute quadrangles.
Map produced by Utah State Parks and Recreation for planning purposes only.
March 13, 2001
N
Drought Pool = 3032 Feet
Full capacity = 3060 Feet

Reservoir). The Washington County Water Conservancy District has designated a "drought pool" (or draw-down level) at an elevation of 3,032 feet mean sea level (msl). This low water level would provide a surface area of approximately 878 acres, or about 64 percent of the full-capacity surface area. The proposed draw-down level should sufficiently support water-based recreation activities without severe impact. The only time lake levels could possibly fall lower than the 3,032 level would be in extreme drought conditions.

Sand Mountain

The 16,564 acre Sand Mountain parcel included in the Sand Hollow Recreation Area boundary is a well-defined land unit that contains a combination of attractive, manageable natural features to support a diverse array of recreation use on a sustained basis. OHV riders, horseback (equestrian) enthusiasts, picnickers, and campers seeking an undeveloped/semi-primitive experience frequent Sand Mountain. The area also hosts competitive motorized and equestrian events as well as guided tours and recreation instruction.

Currently, BLM manages Sand Mountain as part of a 40,725 acre Special Recreation Management Area (SRMA - see Plate 3: *BLM Special Management Recreation Area*). The larger Sand Mountain SRMA also includes the adjacent Dinosaur Trackway paleontologic site, the Fort Pearce historic site and nearby historic trails. While none of these adjacent sites occur within the Sand Hollow Recreation Area boundary, BLM suggests that the planning team explore opportunities to link Sand Hollow with these other sites within the larger SRMA. The BLM has committed to work in partnership with the Sand Hollow planning team in developing a recreation plan for Sand Mountain to accommodate increased recreation and OHV use that is expected to occur within the area. In its 1999 St. George Field Office Record of Decision and Resource Management Plan (ROD/RMP), BLM states that:

> "Generally, lands within this [Sand Mountain SRMA] not already identified [in the St. George Field Office RMP] for disposal or included in current exchange agreements will be maintained in public ownership to provide long-term stability for user groups such as the OHV community who, as a result of urbanization and

Plate 3: BLM Special Management Recreation Area

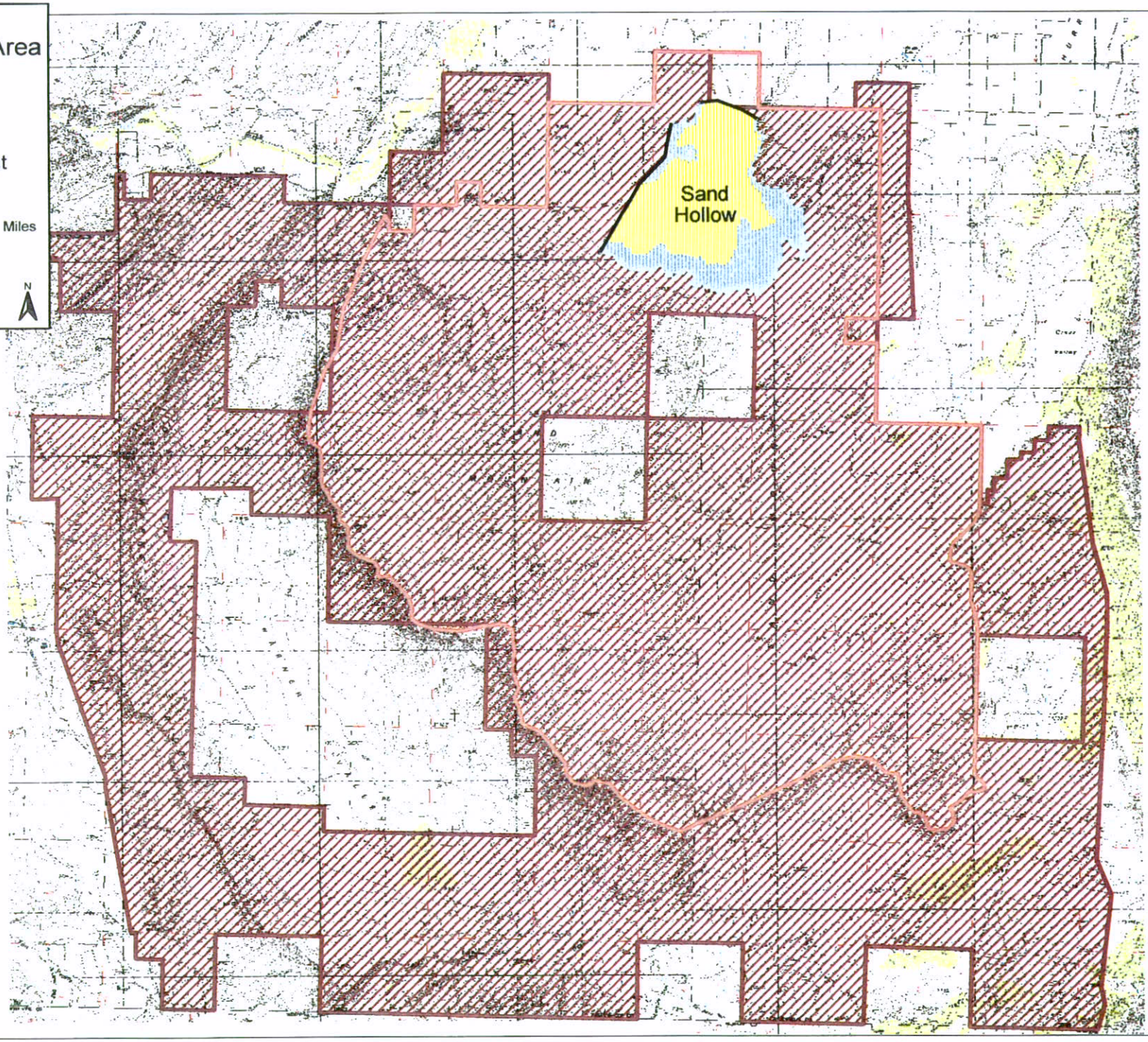
Explanation:

- Sand Hollow Recreation Boundary
- BLM Special Management Recreation Area

0.8 0 0.8 1.6 Miles

BLM Special Management Area approximate position taken from BLM's Dixie RMP and SITLA's ownership layer. Map produced for planning purposes only by Utah State Parks and Recreation. March 13, 2001

N



land use restrictions, have lost much of their traditional open use areas."[2]

BLM has also committed to cooperatively manage the Sand Mountain area with the Utah Division of Parks and Recreation in day-to-day operations to achieve consistent policies regarding issues such as access, law enforcement, user fees and visitor services. BLM will also consider leases or conveyances under the Recreation and Public Purposes Act for high-dollar campgrounds or other facilities.

While Sand Mountain serves as a base for a number of different uses, the Sand Hollow Recreation Management Planning Team shares BLM's commitment to reduce potential conflicts between recreation groups, raise public awareness of impacts on established users groups and adjacent landowners and promote an ethic among visitors that instills respect for property and natural resources. Similarly, the team seeks to eliminate unacceptable impacts to public land resources such as wildlife habitat, watersheds, water quality and cultural resources. BLM has identified a number of specific issues regarding Sand Mountain wildlife, grazing, organized events, and land ownership that should be addressed to minimize conflict and negative impact.

- ***Wildlife Issues***

The BLM's 1999 St. George Field Office ROD/RMP serves as the regulatory baseline for recommended recreation activities in the Sand Mountain parcel of this park. Activities should be consistent with and supportive of this plan.

Efforts will be made to ensure that recreation use does not conflict with the recommendations issued in these established documents. BLM's responsibility will be to evaluate potential recreation developments and activities in the Sand Mountain area and to consider appropriate mitigation strategies under the National Environmental Policy Act (NEPA).

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[2] United States Department of Interior, Bureau of Land Management. (1999). St. George Field Office Record of Decision and Resource Management Plan, Chapter 2, RC-20.

Within the recreation area's designated boundaries BLM recommends that information be made available to ensure that conflicts with floura or fauna do not occur. BLM will work with the Utah Division of Parks and Recreation, Washington County, the Utah Division of Wildlife Resources and other appropriate agencies to ensure that activities are consistent with the St. George Field Office ROD/RMP.

- ***Grazing***

There are two main grazing allotments within the designated recreation area: the Sand Mountain Allotment and the Sand Allotment (see Plate 4: *Grazing Allotments*). The Sand Mountain Allotment is the largest of the two at approximately 15,055 acres, 230 cows and 1,447 Animal Units/Month (AUMs). It is operated by Spillsbury Development between the months of October and May. Since this allotment encompasses almost two-thirds of the designated recreation area, it will likely receive the highest degree of impact from recreational use.

The BLM notes two distinct issues regarding the Sand Mountain Allotment that should be addressed in the plan. First, livestock typically stay in the upper regions of Sand Mountain because of available water resources. However, they will likely be drawn to the reservoir area when the lake is filled. Consequently, fencing will be required around the reservoir areas to minimize recreation and resource conflicts. Secondly, as off-highway vehicle (OHV) use increases within the allotment, maintenance and upkeep of pasture fencing will be critical. In addition, structures such as OHV cattleguards may need to be installed at critical areas to minimize potential conflicts.

- ***Events***

A number of motorized and non-motorized events are expected to continue within the Sand Mountain area. For example, the Color Country Endurance Ride is a major annual equestrian event with routes that cover a large portion of the Sand Mountain area. Likewise, motorized events such as the Rhino Rally are held on held in the area each February. BLM suggests that semi-permanent routes be established for such events to minimize conflict with other users.

Plate 4: Grazing Allotments

Explanation:

Sand Hollow Recreation Area

Grazing Allotments

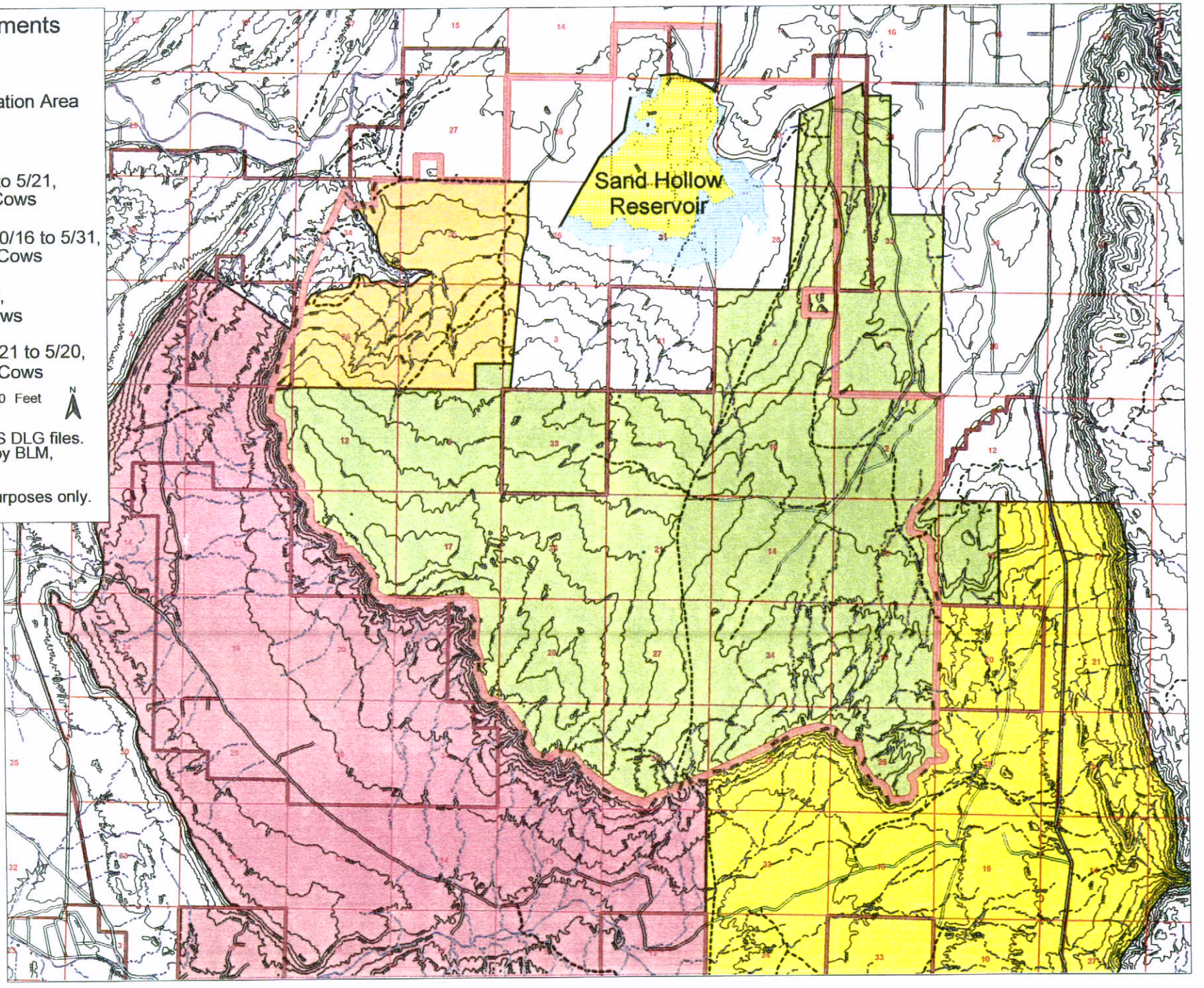
- Fort Pearce, 10/21 to 5/21, 513 AUMs, 114 Cows
- Honeymoon Trail, 10/16 to 5/31, 1237 AUMs, 175 Cows
- Sand, 11/01 to 5/20, 276 AUMs, 41 Cows
- Sand Mountain, 10/21 to 5/20, 1447 AUMs, 230 Cows

3000 0 3000 6000 Feet

N

Base map created from USGS DLG files.
Grazing allotments provided by BLM,
St. George Field Office.

Map produced for planning purposes only.
March 13, 2001



BLM will also work with user groups and other interested parties to minimize cumulative impacts to soils and other resources by collaborating with the BLM Arizona Strip Field Office to rotate events amongst established courses, if needed.

- ***Land In-Holdings***

Two State and Institutional Trust Lands Administration (SITLA) sections are located within the designated recreation area. These SITLA sections lie at the foot of Sand Mountain south of the reservoir (see Plate 5: *Land Ownership*). BLM's St. George Field Office notes that acquiring these two sections through a land exchange will be a top priority issue. BLM has identified parcels in the Carry Hollow area near Bloomington, Utah as possible lands for exchange.

Two private parcels are located within the northernmost SITLA section (see Plate 5). The team recommends that BLM or the State seek to aggregate ownership/control of uses on such in-holdings by acquisition, exchange, agreement, donation or other such mechanisms.

These actions will help ensure more consistent land use throughout the area. This will also help minimize potential interagency conflicts and restrictions in use. In the event that acquisition or trade efforts fail, BLM recommends that actions be taken to avoid trespass on these parcels.

Plate 5: Land Ownership

Explanation:

- Sand Hollow Recreation Boundary
- Sand Hollow/Red Cliffs BLM Recreation Area

Land Ownership

- BLM
- State
- Private

1 0 1 2 Miles

his map was created for the Sand Hollow Planning Team. The land ownership layer was oduced from State Institutional Trust Land's (SITLA) 1:100,000 aolsa coverage. Boundary es represent approximate positions only. Quail Creek Reservoir was digitized from USGS rthophoto Quads. Sand Hollow Reservoir, retention dams, and boundary were digitized from USGS 7.5 minute quadrangles utilizing page G2 of the Sand Hollow Reservoir Project Engineering Drawings as control. Sand Hollow/Red Cliffs Recreation Area approximate sition taken from BLM's Dixie RMP and SITLA'a ownership layer.
ap produced for planning purposes only by Utah State Parks and Recreation.
arch 13, 2001

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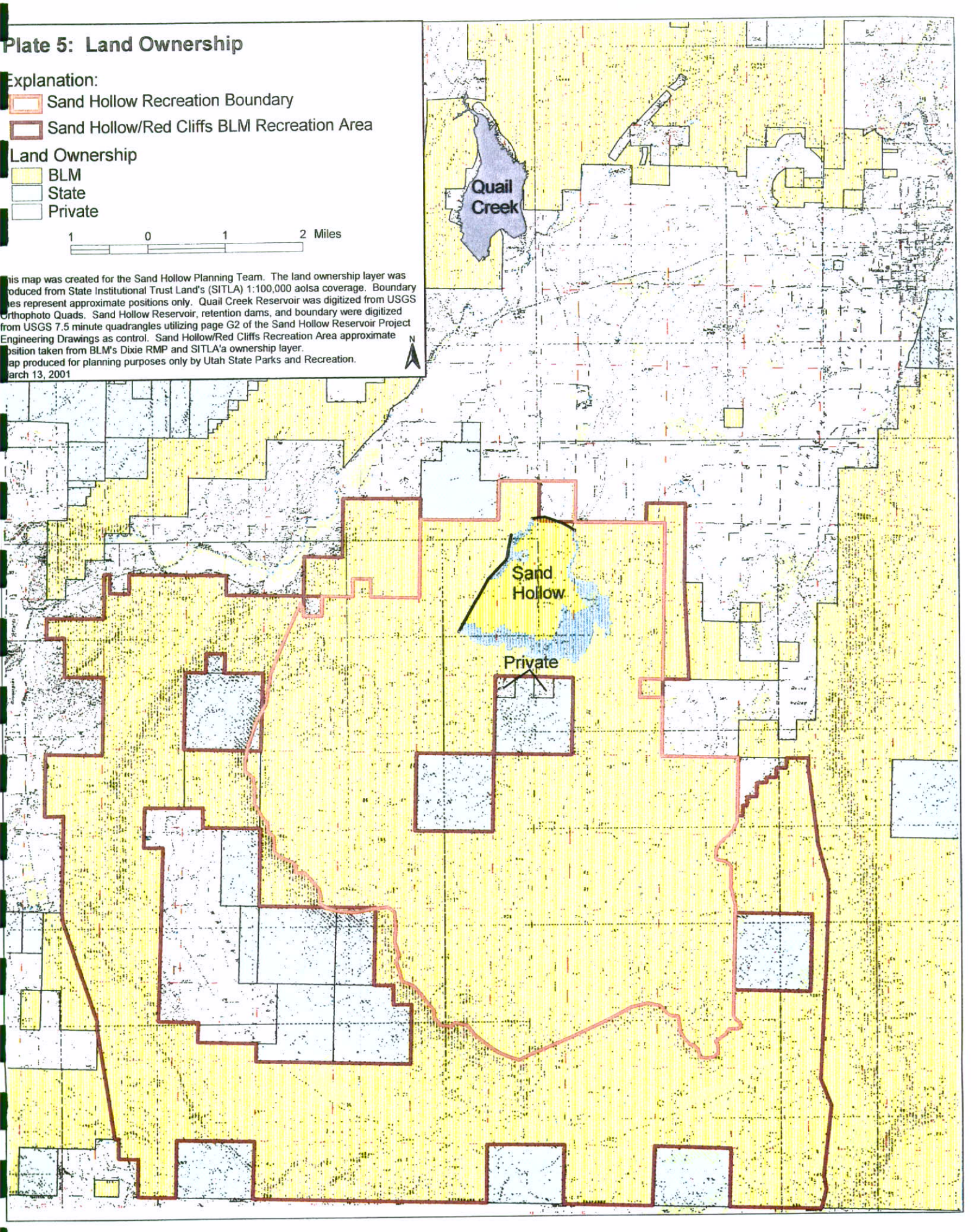

VISITOR SURVEY RESULTS

Sand Hollow Recreation Area "Potential" Visitor Survey Highlights:

- √ A vast majority of survey participants intend to visit the proposed Sand Hollow Recreation Area
- √ Most users will likely participate in water-based recreation and related day-use activities
- √ Most visitors will likely be "day-users"
- √ A majority of survey respondents support the Utah Division of State Parks as the area's primary management entity
- √ Survey respondents are willing to pay fees that are in-line with other State Parks

The Utah Division of Parks and Recreation conducted a survey of potential Sand Hollow Recreation Area users between January and March 2001. The survey was implemented to develop a better understanding of visitor needs, concerns, and potential use patterns. More importantly, the survey provides an additional avenue of public input that - as the reader will note in subsequent sections of this document - will help shape the team's recommendations.

The survey targeted individuals with recreation interests that will likely mirror activities offered at Sand Hollow. Accordingly, the sample population was stratified to represent users with interests in boating, OHV use, camping, horseback riding (equestrian), hiking, fishing and biking.

The sample strata of Boaters and OHV riders were randomly selected from the state-wide population of registered users. Campers were selected from camping reservation data at nearby Quail Creek State Park. Finally, equestrian users, hikers, anglers and bikers were randomly selected from local organized user groups.

A total of 885 questionnaires were mailed out with 636 returned yielding a 71.9 percent response rate. About 56 percent of the survey respondents were Washington County residents. Another 10.1 percent were from Salt Lake County. Overall, residents from 22 Utah counties and seven

other states were represented in the survey. Consequently, the survey results should provide a representative snapshot of likely user needs and concerns at Sand Hollow.

Respondents noted several items of interest which are summarized below (a complete copy of the survey report is attached in appendix A). This information provides important insight about visitor use patterns, activities, needs and concerns.

- ***A vast majority of survey participants intend to visit the proposed Sand Hollow Recreation Area***

Approximately 80 percent of the respondents indicated that they will likely visit the new area when complete (another 11.3 percent said they were "somewhat likely" to visit). Conversely, only 1.3 percent said they would not visit.

- ***Most users will likely participate in water-based recreation and related day-use activities***

Over half of the respondents listed picnicking, limited development camping, hiking, swimming, fishing, and boating (pleasure boating, waterskiing, etc.) as their preferred activities. Accordingly, respondents indicated that boat launching facilities, day-use sites, group-use areas, campsites without full hookups, walking/hiking trails and paved parking are the area's most needed facilities.

- ***Most visitors will likely be "day-users"***

On average, survey participants listed their potential length of stay at about 1.3 days. About 55 percent indicated they will likely stay for one day or less. Another 22 percent listed they will stay for two days.

- ***A vast majority of survey respondents will support the Utah Division of State Parks as the area's primary management entity***

Respondents were asked if they would be willing to support State Parks as the area's managing

entity. Almost 79 percent responded affirmatively. Of the remaining 21 percent who did not support State Parks management, about 7 percent would prefer Washington County; 4.4 percent prefer BLM; 3.1 percent prefer a private concession and 1.6 prefer the Washington County Water Conservancy District.

- ***Survey respondents were willing to pay fees that are in-line with other State Parks***

Almost 55 percent of the respondents would be willing to pay a day-use/entrance fee ranging from $1.00 to $5.00. Similarly, the preferred fee for full-hookup camping was within the $11.00 - $15.00/per day range. It is interesting to note that the typical day-use/entrance fee for a Utah State Park is $5 while the daily fee for full-hookup camping ranges from about $9.00 to $15.00

ECONOMIC IMPACTS

Sand Hollow may be responsible for the generation of more than $3.4 million in income (i.e., wages, rents, interest, profits) and about 77 jobs within Washington County during its first five years of operations. Sand Hollow's impact upon the County may grow to reach $21 million in income and 478 jobs in a long-term time horizon. An analysis of Sand Hollow's potential economic impacts upon Washington County was conducted by Dr. John D. Groesbeck of Southern Utah University (a complete copy of this study is attached in appendix B).

Economic Impacts: Sand Hollow Recreation Area

-Potential Economic Impacts on Washington County:

-Short Run (initial 3-5 years of operation):
- -$3.4 Million in Income
- -77 Jobs

-Long-Term
- -Up to $21 Million in Income
- -478 Jobs

The impacts were estimated on the basis of new recreation as opposed to a redistribution of existing spending from other venues. Washington County experienced sharp increases in both population and personal income between 1990 and 1999. County population increased by 65 percent over the period reaching 81,202 in 1999. By 2010, County population will exceed 122,000. Between 1990 and 1999, per capita personal income rose by more than 46 percent. Dr. Groesbeck notes that spending on leisure goods and services tends to outpace income growth.[3] In the short run therefore, new "supplies" of leisure opportunities - such as Sand Hollow - will be needed to meet demand in the County.

Given the growth in the region however, long run impacts could escalate as more and more recreational services are "exported" to visitors residing outside of the County in addition to an increase in spending among new and existing residents.

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[3] Groesbeck, John D., Ph.D.(1999) An Analysis of the Economic Impact of Recreational Use of the Proposed Sand Hollow Reservoir on Washington County, Utah (Analysis Prepared for the Washington County Water Conservancy District), p.2.

Groesbeck divided the analysis into two components: a short-run scenario where impacts accrue within five years of reservoir completion; and a long-term component where impacts are driven by area growth.

According to Groesbeck, within five years of reservoir completion, the Sand Hollow Recreation Area would attract approximately 100,000 annual visitors who would spend an average of about $21 per visitor day.[4] Based on these assumptions, the Sand Hollow Recreation Area would have an impact of approximately 77 jobs and about $3.4 million in County income.

In the long run, it is assumed that annual visitor days reach 500,000 with average expenditures of approximately $26 per visitor day. Under these conditions, Sand Hollow would be associated with as much as 478.7 jobs and more than $21.2 million in County income.

Visitor day estimates and expenditures patterns listed in the analysis are in line with those of similar state parks. Like these other parks, Sand Hollow will positively impact Washington County's economy.

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[4] Note that this figure is virtually identical to the average expenditure per person, per day estimate for survey results found in the Utah Division of Parks and Recreation's March 2001 *Sand Hollow Recreation Area Potential User Survey Report*, a copy of which is included in Appendix A.

ISSUES AND RECOMMENDATIONS

The planning team recommends that the Sand Hollow Recreation Area be added to the state park system under the auspices of the Utah Division of Parks and Recreation. As with Quail Creek State Park, the Washington County Water Conservancy District will be the "property owners" and will assist State Parks with the development of proposed recreation facilities near the reservoir. State Parks will be responsible for day-to-day *management* of proposed recreation activities and facilities at Sand Hollow Reservoir. BLM will be responsible for development of proposed dispersed recreation facilities and programs on the 16,564 acre Sand Mountain area designated within the park boundaries and will assume the recreation management responsibilities for this area.

With this primary recommendation in mind, the planning team identified actions to effectively manage recreation activities at the Sand Hollow Recreation Area. A number of issu concerning recreation uses, policies, activities and programs as well as needed facilities and staffing were addressed in this plan. Team recommendations were aggregated into six primary issue areas which are: surface boating and personal watercraft (PWC) recreation, fishing and wildlife recreation, non-motorized recreation, motorized recreation, operations management and facilities development.

Recreation Issue Areas:

- ✓ Surface Boating and Personal Watercraft (PWC)
- ✓ Fishing and Wildlife
- ✓ Non-Motorized Use
- ✓ Motorized Use
- ✓ Operations Management
- ✓ Facilities Development

The team expanded its role to include focus groups or subcommittees consisting of users, interested individuals and agency experts. These subcommittees provided the core issues from which the planning team developed recommendations for managing recreation activities in the

area. Under this approach, the plan taps into the expertise of users, recreation officials and other interested parties to effectively capture the recreating public's needs. The public provided additional input through public meetings and opinion surveys (see Appendix A). The recommendations reflect the public's needs.

A number of constraints (e.g., available funding, interagency regulations, sufficiency of staff, etc.) will need to be addressed prior to issue resolution. Team members, planning staff and agency partners identified some of the limiting factors that may hinder implementation of a specific team recommendation.

From these issues, and with the constraints in mind, the planning team developed specific recommendations. The team's recommendations were arrived at by consensus of opinion. Furthermore, team members agreed to ensure that recommendations are consistent with the vision elements listed within the mission and vision statements. A discussion of specific team issues and recommendations under each issue area follows.

I - SURFACE BOATING AND PERSONAL WATERCRAFT (PWC)

Issue Area: Surface Boating and Personal Watercraft

Issues and Recommendations:

I - Personal Watercraft Use
- -Separate launch and parking areas
- -Provide adequate shore facilities
- -Equal regulatory treatment
- -Limits on number of craft on lake
- -Provide for special events

II - Boating
- -Size, capacity limitations
- -Provide adequate ramp facilities
- -On-lake camping

Overview

Issues and recommendations for Surface Boating and Personal Watercraft recreation are broken down into two separate categories: Personal Watercraft and Boating. Needs between each of these groups often differ especially over issues such as law enforcement, launch and parking facilities and fees. Some of the issues identified by the Surface Boating and Personal Watercraft Subcommittee were examined but not adopted by the Planning Team. One such concern involved differential entrance fees for smaller craft. The planning team determined that this is not an issue since fees will most likely be based on a uniform, per vehicle basis irrespective of vehicle size (it was noted that vehicles towing trailers are considered a single unit). Fees will likely be equivalent to other similar reservoirs within the area. PWC recreation and Boating are as follows.

Personal Watercraft (PWC) Recommendations

1. *If feasible, provide separate, smaller launch ramp and parking area for PWC users.*

PWC users express a need for separate launch and parking facilities. Such separate facilities are often beneficial in minimizing conflict and congestion on the main ramp areas. Team members recommend exploring the possibilities of siting and developing a separate PWC ramp on the west dam's southern end (see Plate 7: *Proposed Facilities*). This ramp would be unpaved. Two

constraints will have to be evaluated regarding feasibility: first, the proposed ramp may be of some distance to the water at low reservoir levels; secondly, the ramp will be in close proximity to the busy commuter road.

2. ***Provide necessary shore facilities - accessible, adequate beaches areas, picnic tables, restrooms and sufficient shade and shelter - around appropriate reservoir areas.***

Given the open spaces with minimal existing shade or shelter, it will be necessary to provide shelter, particularly during the hot summer months. Where possible, reservoir facilities such as group pavilions, day use areas/picnic areas and campgrounds should include shade/shelter structures. Also, opportunities exist for the development of natural beach areas on the reservoir's southeastern portion and possibly near the west dam. These beach areas should be in close proximity to restrooms, day use/picnic areas or camping facilities, if feasible. These recommendations should be linked to the development of related facilities.

3. ***Ensure that PWC users receive equal treatment from park officials.***

Members of the PWC subcommittee expressed concern that PWC users are unjustly being singled-out with regards to law enforcement issues. The planning team recommended that staff receive training to ensure consistent law enforcement practices.

4. ***Establish a number of PWCs allowed on the water in relation to the number of boats (2PWCs to 1 boat)***

While there is currently no uniform standard or policy, the Utah Division of Parks and Recreation will research this issue. It was suggested Sand Hollow will provide a good opportunity for implementing such a policy, particularly before the lake is opened and water-based recreation activities are initiated.

5. *Provide an event area for teaching seminars, demonstrations, product shows and races.*

It was recommended that an event area be provided - as needed - for activities such as water ski tournaments, jet ski races and education programs (to teach correct use of PWCs). A designated area that includes facilities such as classroom with an on-water education area in close proximity to the water should be developed. The proposed group use area may suffice for this need (see Facilities Recommendation #3, "Group Campground", on p. 51).

It was suggested that designated areas on the reservoir be partitioned during such events. It was felt that such a designation may be possible since Quail Creek is in close proximity and may be capable of handling "turn-away" users during event periods that are impacted from closing portions of the reservoir.

6. *Provide an area for scuba-diving and snorkeling.*

State Parks should identify areas that can safely accommodate scuba-diving and snorkeling. These areas should be designated for such use and should include underwater markers or signs to guide users.

Boating Recommendations

1. *Limitations on the number and size of boats on the lake*

The boating subcommittee suggested that limitations be set for the number and size of boats on the lake. It was felt that reasonable limitation rules will result in a better quality boating experience.

Currently, Quail Creek State Park prohibits boats longer than 26 feet in length. Planning Team members ultimately recommended that **no limit** be established at this time. Rather, it was suggested that both size and capacity issues be dealt with through a facilities development policy:

Facilities - parking areas, ramps, etc.- should be designed to limit the size and numbers of boats on the lake commensurate with capacity. As with PWC Recommendation #4 (see p.28), the team recommends that the Utah Division of Parks and Recreation currently research this issue and implement a policy preferably before the lake is opened and water-based recreation activities are initiated.

2. *Provide Adequate Ramp Facilities and Parking*

These facilities should include a wipe down lane and a boat "prep" area. Team members feel that these facilities will help maintain smooth traffic flow within the marina.

3. *On-Lake Camping*

The planning team recommended that there be no on-boat camping. However, they suggested that boat mooring would be acceptable for boaters near adjacent designated campgrounds. Team members expressed concern about impacts - water quality being the key concern - from on-lake camping.

II - FISHING AND WILDLIFE RECREATION

Issue Area: Fishing and Wildlife Recreation

Issues and Recommendations:
-Designate wakeless areas for fishing and wildlife viewing
-Placement of structures to support fish habitat
-Stock viable fish species

Overview

Issues and recommendations regarding fishing and wildlife recreation were developed by drawing upon the expertise of Utah Division of Wildlife Resources experts, local anglers organizations and interested users. The participating user groups indicated a willingness to donate time and expertise in the implementation of the recommended actions. The recommendations adopted by the planning team are as follows.

1. ***Designate a portion of the lake wakeless to protect waterfowl and allow a better fishing experience.***

The planning team recommends that such a wakeless area be designated BEFORE lake is opened to ensure clarity with visitor expectations. It was suggested that a wakeless area be designated near the north dam (see Plate 7: *Proposed Facilities*) for this purpose.

2. ***Allow anglers groups or other interested parties the opportunity to place in the wakeless area, structure and habitat that would allow small fish and waterfowl safety and cover.***

One such group - Southern Utah Anglers Association - is willing to help implement this recommendation. These structures should be installed before the reservoir fills for two reasons. First, their installation and placement will be much more efficient and economical. Secondly, and more important, these structures will need to be in place to ensure survival of stocked fish. Construction and installation costs can be minimized by implementing this recommendation as part of a donated community-service project.

3. *Allow the Division of Wildlife Resource to stock the lake with viable fish species.*

Utah Division of Wildlife Resource (DWR) experts will need to assume this responsibility by virtue of their statutory authority. Suggested fish for stocking would be only those that would survive in warm water, for instance: bass, bluegill and possibly wiper (a sterile cross between the white bass and the stripped bass) It was also suggested that DWR stock some type of shad as an additional forage fish for the largemouth bass and the wiper.

Constraints

The recommendations adopted by the planning team are tempered by some constraints. First, liability issues may accompany the placement of structures to support fish habitat. Wakeless speeds are essential in these areas to help minimize this risk. Secondly, all fish introduced must be federally approved (in accordance with the current management programs regarding threatened and endangered Virgin River fish species). The Utah Division of Wildlife Resources should work with this plan's managing partners to prepare a plan for fish introduction.

III - NON-MOTORIZED RECREATION

> **Issue Area: Non-Motorized Recreation**
>
> Issues and Recommendations:
> -Provide information/education to minimize potential conflicts
> -Provide adequate parking/staging areas
> -Needed signs and information
> -Trail Etiquette
> -Provide equestrian hitching posts
> -Explore need for equestrian camping
> -Promote Sand Mountain events

Overview

Issues and recommendations regarding non-motorized recreation include the input of equestrian enthusiasts, hikers, and mountain bikers. The area of primary focus is Sand Mountain. The Planning Team supports the concept of open use in the Sand Mountain area. Consequently, a wide variety of use - equestrian, motorized, mountain biking, hiking - would be included in the recreation mix. The team determined that major trail improvements - paving, or graveling, to accommodate a specific use - would be difficult to maintain, and may prove too costly for any one type of activity. Rather, it was felt that development should be limited and commensurate with the area's natural features. Information will be key to providing Sand Mountain users with a safe and satisfying experience. With these constraints in mind, the planning team adopted the following non-motorized recommendations.

1. *Provide information/education to minimize conflicting use in the area*

Visitors often express a need for more detailed information about area trails, campgrounds and related facilities. Given Sand Mountain's large area, it is impractical and inconsistent to prescribe and enforce rules confining various types of acceptable "open" uses to specifically defined areas. Rather, to minimize potential conflict, it was felt that information should be provided at entrance/access points that: 1) provides an inventory of the different types of uses that occur on Sand Mountain; and 2) highlights those areas most conducive to the particular experience sought by the visitor.

2. *Provide adequate parking and staging areas for all users*

Team members noted that adequate parking should be provided for the various groups who will use Sand Mountain. These areas should also allow equestrian and motorized users to stage (unload/load) horses or OHVs to access area trails (see Motorized Recommendation #1 on p. 37 below). These areas should provide adequate parking space, informational signing an all-weather surface (preferably graded gravel), boundary fencing, restrooms and garbage facilities.

Both Equestrian and motorized users recommend that such parking/staging areas be provided at the following points (see Plate 6: *Potential Recreation Opportunities*):

- The east side of Sand Mountain, south of Hurricane near Sky Ranch;
- The area's west side near the Washington Fields diversion dam.

These areas should provide adequate space and turn-around area for horse trailers. They should include hitching posts and adequate information about trails, distances, potential weather conditions, available water supplies, etc. Several user groups recommend that these outlying parking/staging areas should be unpaved and limited in scope of development to minimize impact on the area.

3. *Signs and information indicating present location, destinations, distances, severity, available water and points of interest should be posted at primary access points.*

Information (including other media such as topographic maps) should be provided at trail heads, staging areas or other relevant locations. The park's information and mapping needs should be evaluated and accurate, high-quality information should be developed appropriately. State Parks should work with BLM as well as interested users to assess needs and implement actions. A number of the following steps may need to be considered:

- Utilize GPS work to map all park roads, trails, features and facilities; also determine trail distances
- Evaluate map and brochure needs for the park

- Include potential water resources - a concern for equestrian users
- Seek partnerships with appropriate entities to obtain input and funding for the production of maps
- Update (as needed) all relevant information; ensure that it is accurate
- Ensure that visitors are also provided with a sufficient amount of educational information about the park's natural features, including: area history; geology; wildlife; botany; paleontology; cultural resources; and other information as applicable

4. *Install signs/information concerning trail etiquette at access points, along trails and at other appropriate locations.*

Signs are also needed to educate trail users about proper conduct to minimize potential conflicts. This is especially critical for equestrian users. Horses often are "spooked" by mountain bikers, and motorized users. Such encounters are potentially dangerous. Consequently, team members feel that efforts to educate and inform via appropriate signage or information are needed to minimize such risks. It was suggested that the managing partners install signage similar to that found in equestrian areas at Snow Canyon State Park and Zion National Park. It was also recommended that "Leave No Trace" information be provided as well. Organizations such as Back Country Horsemen are willing to assist in the development of appropriate signage/information.

5. *Equestrian hitching posts should also be installed at key destinations such as the Dominguez-Escalante Trail overlook and other interesting scenic viewpoints along Rim Trail.*

Tying horses to small bushes is neither ecologically sound nor practical. Therefore, hitching posts should be installed at dispersed destination points in addition to parking/staging areas. Locations include the Dominguez-Escalante Trail overlook, and the Warner Valley overlook along the Rim Trail. Other relevant points should also be identified. Equestrian groups such as the Back Country Horsemen are willing to help implement this recommendation.

6. *Explore potential opportunities for a separate equestrian campground.*

Team members noted the potential conflicts between equestrian and non-equestrian campers. A separate camping facility may be needed to minimize conflict. However, there was some concern expressed about the actual demand for an equestrian-based campground relative to other recreational activities, needs and priorities. It was therefore determined that this issue should be evaluated further to see if demand would warrant such a facility. It was noted that BLM has the option of constructing primitive campsites that may accommodate equestrian users in the southern portion of the area.

7. *Continue to Utilize Sand Mountain for Recreational Events*

The team supports continued use of the Sand Mountain area for special events such as the annual Color Country Endurance Ride for equestrian users (note that other motorized events are typically held in the area as well). It is crucial that event planning and coordination efforts effectively minimize potential conflicts. The planning team recommends that with collaborative management of the area, it is essential that only one entity issue fees/permits - no multiple fees from different agencies for such events.

IV - MOTORIZED RECREATION

> Issue Area: Motorized Recreation
>
> Issues and Recommendations:
> -Facilities needs: staging areas, campground, information, day-use
> -Fees
> -Regulatory Enforcement
> -Wildlife/Habitat Impacts
> -Information/Education

Overview

Recommendations for motorized use were identified from issues raised by a subcommittee consisting of motorcyclists, four-wheeler (OHV) enthusiasts and four-wheel drive (truck/jeep) users. Like the non-motorized recommendations, the primary area of focus is Sand Mountain. Information, education and limited development of the Sand Mountain area are the central themes with each of the following motorized recommendations adopted by the team.

1. *Facilities needed for motorized recreational use include staging areas, an OHV campground, information kiosks, and day-use areas*

- ***Staging Areas***

It is recommended that two multi-user parking/staging areas be provided (see Non-Motorized Recommendation #2, p. 34). As mentioned above, two areas on BLM property were identified: one located at the Washington Dam access on the area's west side; and the second, south of Hurricane, Utah on the east side of the proposed recreation area (Refer to Plate 6: *Potential Recreation Opportunities*). An easy access-route from the Washington Dam staging area may need to be identified and provided. Staging areas should provide adequate parking space, informational signing, an all-weather surface (preferably graded gravel), boundary fencing, restrooms and garbage facilities.

Team members noted that there may be increased traffic flow on 700 West Street in Hurricane - the road that leads past Sky Ranch to the proposed east-side dispersed staging area. The team recommends that Hurricane and Washington County evaluate and plan for anticipated increases

in traffic volume due to Sand Hollow as well as other development that is slated to occur in the area.

- ***OHV Campground***

An OHV campground and associated parking/staging area should be provided at the sand dune/slickrock area south of the proposed road near the reservoir's south end. The campground should be relatively primitive with designated camp sites (some useable by large motorhomes), all-weather travel surface, defined perimeter boundary, garbage and restroom facilities, minimal shade structures, and informational signing.

This area may be impacted by the proposed Southern Corridor road alignment running eastward from the Warner Valley/Washington Diversion Dam area west of the park. Impacts may affect access between the proposed OHV campground and the reservoir area. The alignment may also make it difficult to control dispersed staging and access of Sand Mountain. The team recommends the BLM and State Parks coordinate with the Southern Corridor Task Force to monitor potential impacts.

There are two small parcels of private land located in section 36, T. 42 S., R. 14 W. that may be within the proposed campground site (see Plate 5: *Land Ownership*). As noted above, the team recommends that BLM and/or the State seek to aggregate ownership/control of uses on such in-holdings by acquisition, exchange, agreement, donation or other such mechanisms.

- ***Information Areas***

An informational area with posted regulations and map availability should be provided at the OHV campground and parking/staging areas. Visitors would be notified that this is a multi-user recreation area where both motorized and non-motorized recreation is acceptable. Users having a specific conflict with motorized use would be informed of other areas where motorized use is not allowed and their recreational expectations can be fulfilled. Motorized users would be advised of proper etiquette for non-motorized users such as equestrian, mountain biking, and hiking.

- ***Day-Use Areas***

An OHV-accessible day-use area should be provided near the reservoir's south shore. This area will link Sand Mountain with the reservoir and should include picnic facilities and shade/shelter. OHV activities should be confined to a designated perimeter within this area to avoid conflicts with reservoir users.

It is also noted that a private entity is proposing construction of a motocross track outside of park boundaries but in close proximity to the Washington Dam access area. Team members do not object to this proposal as long as the activity doesn't conflict with the proposed staging areas. The team recommends BLM coordinate with State Parks and the Water District regarding all potential activities in proximity to the park's boundaries.

- ***OHV Facilities: General Comments***

In general, the placement of facilities for motorized users should be segregated as much as practical from facilities for non-motorized users to help minimize potential conflicts and help ensure visitor expectations are met.

Finally, there are concerns of how the handle the target and recreational shooting (particularly) in the Washington Dam area of the Sand Mountain SMRA. To ensure visitor safety, the team recommends closure to indiscriminate shooting on public lands within the designated park boundaries. Specifically, BLM and State Parks should work with the appropriate local entity - cities, Washington County, etc. to evaluate relevant ordinances and curb shooting in certain areas (staging areas, for example). Hunting should also be evaluated in terms of visitor safety. Any changes to current hunting rules will need to be coordinated with the Utah Division of Wildlife Resources.

2. *Fees for motorized use*

It is recommended that expenditures for facilities including the parking/staging areas and the OHV campground be kept to a minimum to help ensure low fees. The fee structure should reflect the level of services provided; higher fees to use the more developed portions of the park; lower fees for dispersed, undeveloped areas such as Sand Mountain.

Where fees will be required, establish a daily use fee per vehicle and a yearly permit-type pass. The OHV subcommittee recommends that a daily entrance fee range from $1.00 to $5.00 per vehicle (See Operations Management Recommendation #3, pp. 46-47). Fee collection at the proposed Washington fields and Hurricane staging areas could be voluntary utilizing a metal deposit box (a.k.a. "Iron Ranger") for fees paid. Alternatively, an annual pass ranging in price from $10.00 to $15.00 could also be instituted for OHV users entering the area from remote access points.

Historical users oppose fees for use in dispersed dune areas where they have previously not had to pay. Uniform enforcement of a collection system in these areas would be nearly impossible and therefore should be mostly voluntary.

Finally, fees should be standardized, i.e., levied on a singular, central basis and should allow access to all designated areas. Fees should also be standardized for competitive events. Competitive events may result in temporary but exclusive use in certain areas.

3. *Enforcement of State and Federal Regulations*

- ***Make regulations clear; Emphasize education with enforcement***

Enforced regulations regarding OHV use for which a user may be subject to should be posted at informational, camping, and parking/staging areas. Enforceable regulations should be clearly stated and should explicitly cite the enforcement actions that may be anticipated. Enforcement

activities - particularly those in the dispersed area south of the OHV campground - should focus more on user education as opposed to citation issuance to achieve regulatory compliance.

- ***Vehicle flags***

The enforcement of flags on vehicles needs to be done with discretion. For example, the use of flags on motorcycles (especially trials motorcycles) is difficult to achieve and may be a safety issue to the rider.

- ***Utilize OHV groups and clubs to educate users***

Utilize user groups and clubs, both motorized and non-motorized to help educate users. Such groups often help improve voluntary compliance with regulations.

- ***Prohibit "pallet bonfires"***

OHV users express concern about the random burning of discarded wooden pallets in the Sand Mountain area. Nails from the residual debris damage tires and pose additional safety hazards. Moreover, these fires often leave unsightly litter and charred landscapes. It is recommended that the use of pallets for fire building be prohibited. BLM may recommend prohibitions to such types of fire in certain areas.

4. *Impact of environmental, species, and habitat issues on motorized recreation*

- ***Maintain "open" designation for Sand Mountain area***

The BLM's open designation for the park's designated Sand Mountain area Recreation needs to be protected. Motorized users express concern that Sand Mountain is the only sufficient area in Washington County currently classified as "open" for motorized recreation by the controlling land use agency.

As mentioned above, recreation activities should be consistent and supportive of BLM's St. George Field Office 1999 Resource Management Plan/Record of Decision. BLM's

responsibility would be to evaluate potential developments in the Sand Mountain area and to consider appropriate mitigation strategies under the National Environmental Policy Act (NEPA).

5. *Area users should be adequately informed and educated about regulations and other OHV-related issues*

- ***Signs and information: General***

Install adequate signs at kiosks and staging areas to inform users of general regulations, restrictions in specific areas, resource concerns, and proper user etiquette. Make educational literature such as "Tread Lightly" pamphlets available. Provide information about potential resource conflicts within the area. Also, discourage littering and vandalism.

- ***Signs for routes and other open areas***

Install signs designating open areas and identifying short, specific routes for those wanting to stay close to the campground or staging areas.

- ***Maps***

Make maps of the entire area available. Maps should display facilities, main trails, resource concerns, and recommended use areas (see Non-Motorized Recommendation #3, pp. 34-35). Maps should also include potential routes or trails that link Sand Hollow with other recreation opportunities within the area.

- ***Sign Maintenance, Content***

Signs away from camping or staging areas should be minimal and easily replaced. Signs should identify specific resource concerns and identify the area's boundary. Signs identifying specific routes may be necessary but should be minimal.

- ***Signs should identify "recommended" use areas***

Identify areas where specific uses could be recommended. This would include non-motorized

uses as well as motorized. Recommended areas for motorized users would include the slickrock area on the west side of Sand Mountain as a Jeep area; the slick rock area near the reservoir's south end as a Motorcycle Trials area; and the sand dune areas as particularly suitable for 4-Wheelers (see Plate 6: *Potential Recreation Opportunities*). These areas would be recommended but remain open for all users.

- ***Establish voluntary trail patrols***

Utilize Trail Patrol concepts and local user groups to help educate and monitor users. These groups could "adopt" the trail signs and replace them as necessary. Motorized users should be informed that their use of this area is a privilege and they are welcome to use it but must take care of it.

- ***Designate an OHV training area***

An area for training and instructing proper use of OHVs should be established. It was recommended that part of the area below the west dam be set aside for in-park OHV training.

- ***Install interpretive signing***

Interpretative signing should be considered and installed where appropriate. For example, interpretive signs concerning area geology, wildlife, etc., could be installed at the Escalante Trail Overlook. BLM will assist with the development of information and signage on Sand Mountain.

- ***Inform users of linkages with trails outside the area***

Provisions to link with current and planned travel routes outside the Sand Hollow boundaries should be included. It is suggested that the Utah Division of Parks and BLM work with user's groups to identify trails or routes linking Sand Hollow with other points of interest. This could be done with informational signing at access/entrance points, maps or trail signs.

Plate 6: Potential Recreation Opportunities

Explanation:

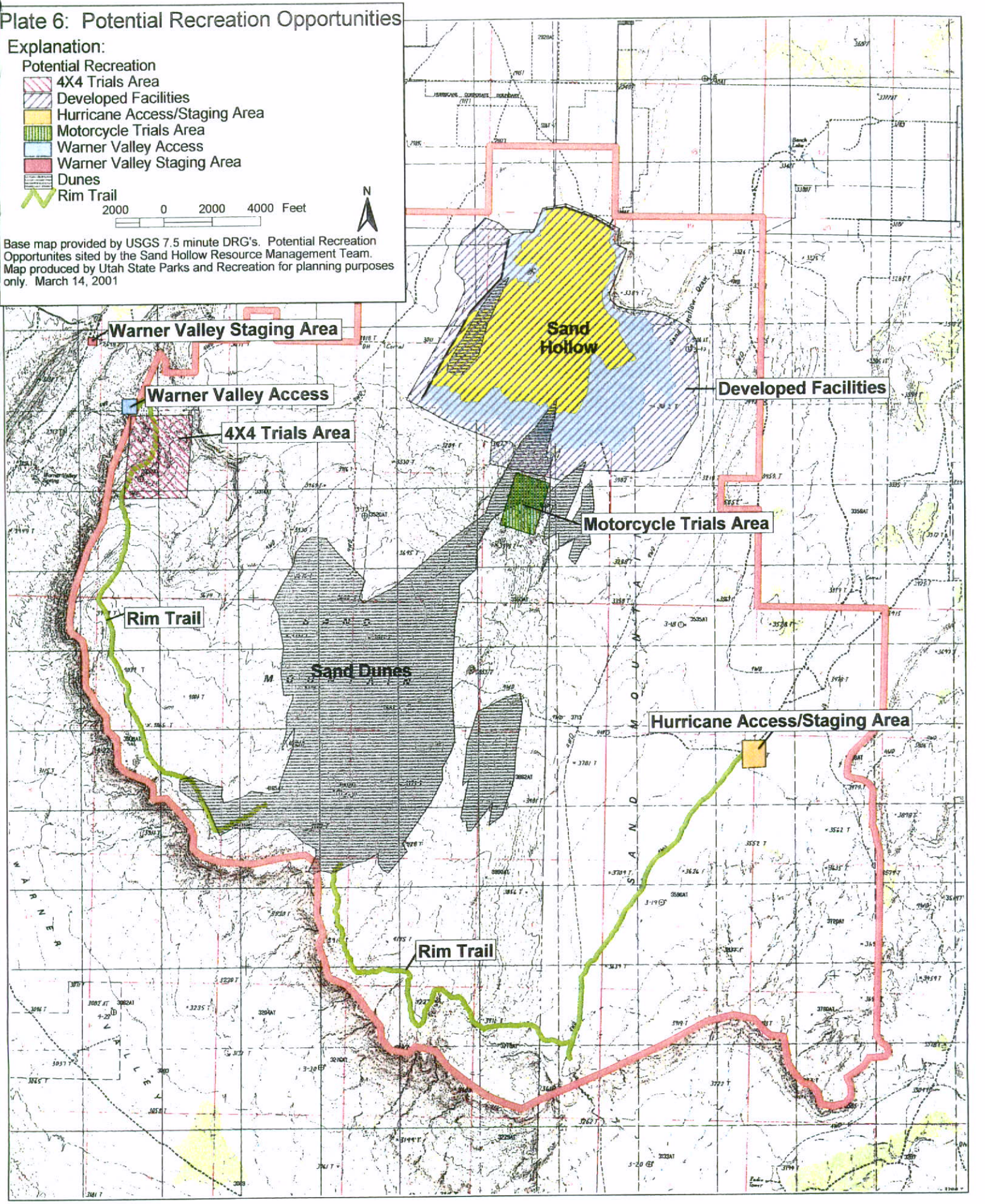
Potential Recreation

- 4X4 Trials Area
- Developed Facilities
- Hurricane Access/Staging Area
- Motorcycle Trials Area
- Warner Valley Access
- Warner Valley Staging Area
- Dunes
- Rim Trail

2000 0 2000 4000 Feet

N

Base map provided by USGS 7.5 minute DRG's. Potential Recreation Opportunites sited by the Sand Hollow Resource Management Team. Map produced by Utah State Parks and Recreation for planning purposes only. March 14, 2001



V - OPERATIONS MANAGEMENT

> Issue Area: Operations Management
> Issues and Recommendations:
> -Ongoing operations & maintenance needs
> -One-time operations & maintenance needs
> -Fees

Overview

As previously mentioned, the planning team recommends that the Sand Hollow Recreation Area be added to the state park system under the auspices of the Utah Division of Parks and Recreation. It will require approximately $513,000 to initiate operations and maintenance of this park.

As with Quail Creek State Park, the Washington County Water Conservancy District will be the "property owners" while State Parks will be responsible for day-to-day management of recreation at Sand Hollow Reservoir. At the same time, BLM will be responsible for the lion's share of day-to-day management on its 16,564 acre Sand Mountain area designated within the park boundaries. Consequently, this plan provides recommendations on personnel and expenditures required to maintain and operate Sand Hollow Reservoir and its associated facilities. This section also includes an analysis of operations and maintenance requirements for cooperative management of Sand Mountain.

A subcommittee led by the Utah Division of Parks and Recreation was charged with the responsibility of identifying these operation and management needs. Recommendations include an analysis of required personnel to effectively manage the entire reservoir area. It is also assumed that management responsibilities will be shared with BLM in the park's Sand Mountain area.

Table 1: Operations and Maintenance Expenditures for Developed Facilities

On-Going Expenditures: ***Personal Services***

Position	Full-Time Equivalents (F.T.E.s)	Required Budgetary Allotment
Assistant Park Manager	1	$51,561
Park Ranger II	1	$44,884
Park Ranger II	1	$44,884
Journey Maintenance Specialist	1	$42,498
Seasonal Positions	4.5	$79,582
Total Personal Services:	**8.5**	**$263,409**

On-Going Expenditures: ***Travel and Current Expenses***

Category	Required Budgetary Allotment
Travel Expense	$2,500
Current Expense (phones, office equip., supplies, etc.)	$75,000
Total Other On-Going Expenses:	**$77,500**

One-Time Expenditures

Item	Quantity	Required Budgetary Allotment
Handheld Radios	3	$4,200
Mobile Radios	3	$5,100
Boating Radio	1	$1,700
Tractor and Attachments	1	$25,000
Shop Tools	Assorted	$15,000
Maintenance Vehicle	1	$28,000
Ranger Vehicles	2	$45,000
Boat and Trailer	1	$35,800
OHV and Trailer	2	$12,400
Total One-Time Expenses:		**$172,200**

1. *On-Going Expenditures Required for Operations and Maintenance*

It was determined that an annual budget of approximately $340,900 will be required for State Parks to operate and maintain the park's developed facilities. These on-going expenditures are allocated among three primary areas: personnel, current expenses (office equipment, phones, supplies, etc.) and travel. These categories are displayed in table 1 above. Personnel accounts for approximately 77 percent of this required amount: Sand Hollow will require at least 8.5 full-time equivalent (FTE) positions. Total annual personnel expenditures are estimated to be

$263,409. Other on-going expenditures are estimated to be about $75,000 for current expenses and about $2,500 for travel.

BLM will budget for three positions to manage its Sand Mountain parcel: an OHV coordinator; a Recreation Technician, and a full-time law-enforcement ranger. BLM will also provide assistance in implementing recommendations for Sand Mountain recreational use - trail development, signing, kiosks, staging areas and other related activities - by utilizing its St. George Field Office planning staff as well as through the use of grant monies and volunteer personnel.

2. *One-Time Expenditures*

More than $172,000 will be needed to acquire radios, maintenance equipment and vehicles to operate and maintain developed facilities at Sand Hollow. These necessary one-time expenditures are also listed in table 1.

3. *Fees*

The planning team listed two overarching criteria to guide park fee collection: first, fees should be commensurate with the level of services provided and; secondly, fees should be simple to understand and should not be burdensome or redundant.

Since most development will occur near the reservoir area and since such development and associated recreational opportunities are "new" to the area, it is not unreasonable to expect that fees will be charged for use. However, charging fees in open areas that have traditionally been "free" to users - as is the case with the Sand Mountain parcel - is an area of concern. Under the team's guiding fee criteria - fees for services provided and simplicity - we examine potential fee structures at both the developed recreational facilities near the reservoir and on BLM's Sand Mountain parcel.

- ***Fees for developed recreation***

For developed recreation facilities (see Plate 7: *Proposed Facilities* below), it is recommended that the plan adopt a typical Utah State Parks fee schedule. A typical day-use/entrance fee for parks such as Quail Creek or Jordanelle is $5.00. Camping fees would be contingent upon the facilities provided. For example, fees ranging from about $7.00 to $11.00 are typically charged for primitive (i.e., undeveloped tent campsites) sites. Developed campsites range from about $9.00 to $15.00 per day in other state parks.

- ***Fees for "dispersed" recreation in the Sand Mountain area***

Since fees have not been levied for use in BLM's Sand Mountain SMRA, many users express concern about the institution of a fee policy. On the other side of the argument, if an area-wide fee is not charged, there is concern that individuals may enter and use developed facilities by accessing remote locations on Sand Mountain. Moreover, several development items (signs, parking/staging areas, restrooms) are recommended for Sand Mountain. Allowing free entrance would place further strains on the managing partner's ability to cover the costs of providing desired development items.

Consequently, this issue will need more review. Team members recommend that existing fee structures for similar sites be evaluated. In the event that a fee structure is adopted, the team recommended that users first be educated - through education or information at designated fee collection areas - about why such a policy is needed and how monies are distributed. Secondly, an area-wide fee would be charged to include Sand Mountain as well as the reservoir area. The team realizes that fees will be difficult to collect given the large number of access points to Sand Mountain.

An area-wide fee may take the form of an annual "permit" or "pass"(see also Motorized Recommendation #2 on p. 40) or a voluntary system with collection boxes ("Iron Rangers") at designated locations. It is also recommended that a single agency issue fees, annual passes or event permits to minimize duplication and enhance customer service (see Non-Motorized

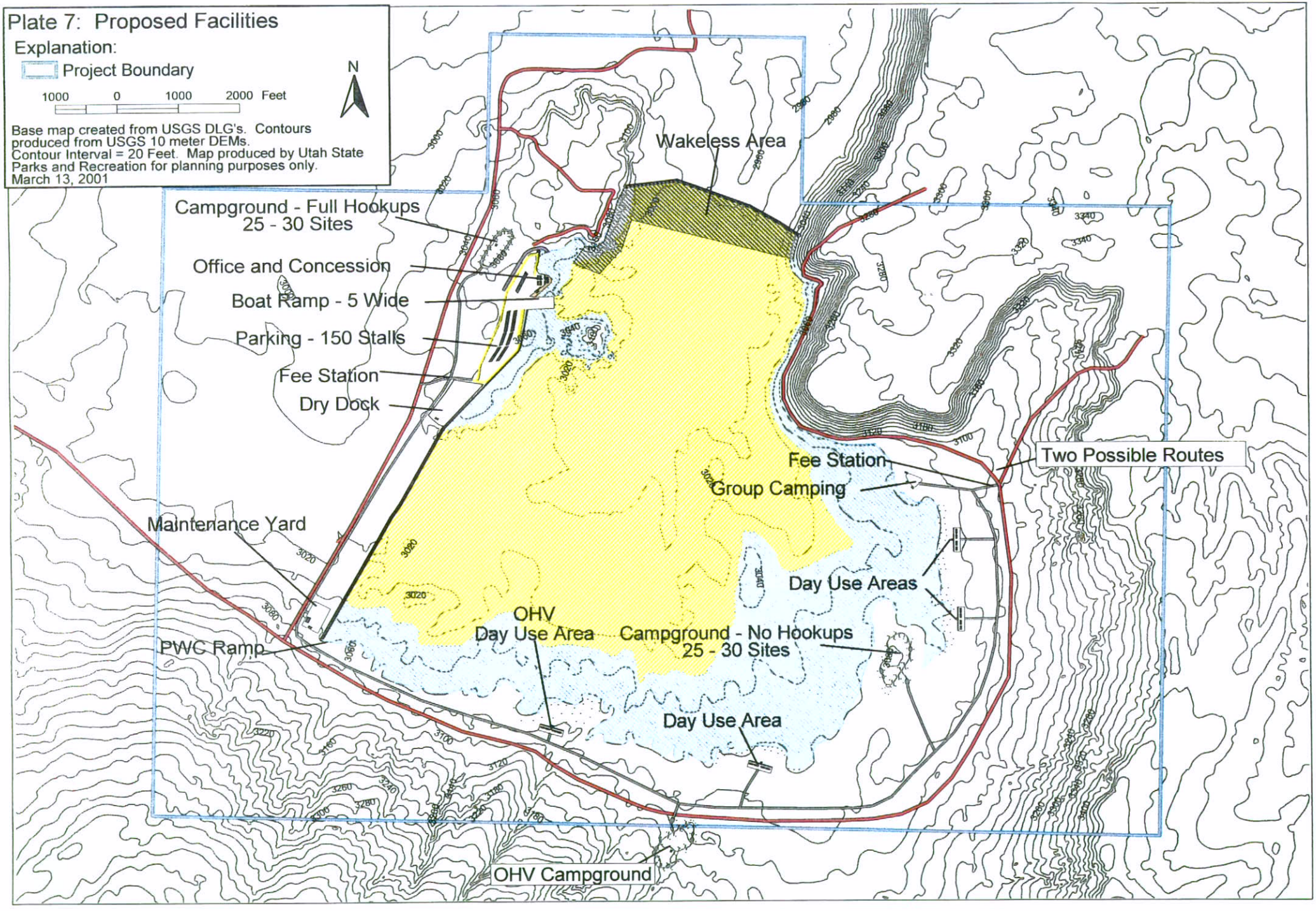


Plate 7: Proposed Facilities
Explanation:
Project Boundary
N
1000 0 1000 2000 Feet
Base map created from USGS DLG's. Contours produced from USGS 10 meter DEMs.
Contour Interval = 20 Feet. Map produced by Utah State Parks and Recreation for planning purposes only.
March 13, 2001
Wakeless Area
Campground - Full Hookups
25 - 30 Sites
Office and Concession
Boat Ramp - 5 Wide
Parking - 150 Stalls
Fee Station
Dry Dock
Fee Station
Two Possible Routes
Group Camping
Maintenance Yard
Day Use Areas
OHV
Day Use Area
Campground - No Hookups
25 - 30 Sites
PWC Ramp
Day Use Area
OHV Campground

Recommendation #7 on p.36). The team also recommends (federal) legislation be drafted creating a jointly-managed account that allows revenues to be ploughed-back into the Sand Hollow Recreation Area.

VI - FACILITIES DEVELOPMENT

Issue Area: Facilities Development

Issues and Recommendations:
-Proposed Reservoir Facilities:
- -Campgrounds
- -Group Sites
- -Marina Facilities
- -Day Use Areas
- -Miscellaneous Facility Needs

-Proposed Sand Mountain Facilities:

Overview

The Planning Team's mission statement stipulates that facilities should both meet the various user needs and minimize potential user/resource conflicts. The team's proposed facilities recommendations will meet this objective. The Sand Hollow Recreation Area will contain include two separate lakeside campgrounds, a third OHV campground on Sand Mountain, as well as numerous day-use facilities, staging areas, marina facilities and group use sites to meet the needs of water-based users, OHV enthusiasts and non-motorized groups. The proposed design should minimize conflict among each of these groups. Moreover, most developmental impacts will be confined to the Water District's reservoir area with minimal proposed development on BLM's Sand Mountain. As noted earlier, the Utah Division of State Parks will be responsible for management of facilities developed on Water District properties near the reservoir site while BLM will be responsible for managing those on its Sand Mountain parcel.

An analysis of needed facilities was conducted by a Facilities Development Subcommittee comprised of Planning Team members, representatives from the Washington County Water Conservancy District and State Parks officials. The facilities recommendations adopted by the team address the relevant issues raised in the recreation-related areas above. Moreover, they are congruous with public input: from user groups, opinion surveys and from the public at large. It is estimated that construction costs for the proposed facilities will be approximately $7 million dollars. A three-way partnership between the Water District, BLM and State Parks will be essential in securing necessary project funds.

The Team's Facilities and Development subcommittee focused on identifying needed facilities

near the reservoir site. Facilities for the park's Sand Mountain parcel were previously identified in the Motorized, Non-Motorized and Fishing/Wildlife recommendations presented above. This section first provides an overview of recommended facilities at the reservoir area. It then briefly summarizes the recommended Sand Mountain facilities proposed by the various recreation subcommittees.

Proposed Reservoir Facilities (see Plate 7 for location of proposed facilities discussed below)

1. *Full Hookup Campground Near Marina*

The team recommended that a 25 - 30 site campground be developed in close proximity to the boat ramp/marina facilities with an adequate view of the reservoir. This campground "loop" will be located on a knoll in the park's northwest corner, approximately 300 yards from the proposed marina/boat ramp area. The campground will be sited approximately 20 feet above the top of the west dam's spillway and should therefore provide visitors with a pleasant view of the reservoir. Moreover, the proposed site - on the knoll area - will serve as a natural buffer since it is located some distance from adjacent private lands.

This campground will accommodate users desiring to be within close proximity of both the marina and the reservoir. It will include full hookups (water, power, sewer), and a restroom with flush toilets and showers. Campground sites will allow recreational vehicles (R.V.s) "pull-through" access and will also include fire pits and picnic tables with shelters.

2. *Beachfront Campground*

The team recommends development of a 25 - 30 site campground on the reservoir's southeastern shore. This campground loop will provide visitors with easy access to the area's sandy beaches. Day use areas are also in close proximity to this site.

Like the Marina Campground, sites will allow recreational vehicles (R.V.s) "pull-through" access and will also include fire pits and picnic tables with shelters as well as a restroom with flush toilets and showers. However, no utility hookups will be provided. As was noted in the Boating and Personal Watercraft recommendations, this area may provide boat mooring for campers located near the water's edge. Also, in the event that the proposed OHV Campground is not constructed, OHV users would be provided access to this facility (See Sand Mountain Facilities Recommendation #1 on p.54) .

3. *Group Campground*

A group campsite will be developed on the reservoir's east side in close proximity to the beach. The site will accommodate groups of 100-200 individuals and will include covered pavilions with tables and grills, a restroom with showers and a parking area for autos and R.V.s. This area will provide visitors with easy access to the area's sandy beaches and adjacent day use areas. As recommended above, adequate shade and shelter will be a key issue at this site for use during the hot summer months. Restrooms should also be in close proximity to the facilities.

Team members also recommend that this area be used for water-related events and training. As noted in PWC recommendation #5, an event area should be provided - as needed - for activities such as water ski tournaments, jet ski races and education programs (to teach correct use of PWCs). A designated area that includes facilities such as classroom with an on-water education area in close proximity to the water should also be developed. The team recommends that this group use area be developed and utilized to meet these needs.

4. *Marina*

The marina, located on the west dam's northern portion will include a five-lane boat ramp, a 150 stall parking area, a multipurpose office/concession facility and a dry-dock area ***(fish cleaning station?; floating docks?)***. It is recommended that a maintenance yard also be included on the dam's southern end.

The five-lane boat ramp will be constructed on a 12 percent grade and will provide launch access to a lake elevation of 3,010 ft. - 50 feet below the 3,060 ft. reservoir capacity level. Boating and PWC recommendations adopted by the planning team suggest exploring the feasiblity of the siting and development of a separate PWC ramp on the southeast portion of the west dam (as discussed in PWC recommendation #1 above). The recommended boat wipe down/"prep" lane will also be constructed as part of the marina/ramp area. This lane will be located at the top of the ramp running on a line perpendicular to the ramp structure. Finally, marina facilities - parking areas, ramps, etc.- should be designed to meet designated lake capacity and size limitations set by the Utah Division of Parks and Recreation.

Parking will run from a knoll north of the proposed ramp southward parallel to the west dam. Office and concession facilities will be located near this knoll. In addition to meeting the needs of park staff, office facilities should provide visitors with adequate information (brochures, maps, regulations, etc.) about recreation opportunities within the entire area. As mentioned in the team's vision statement, private concession opportunities should be provided - where appropriate - to meet the needs of the various recreation users at the site. The team felt concession services such as convenience retail items (e.g., ice, drinks, food, etc.), boat/PWC rentals and other related items would be appropriate. It was also recommended that the planning partners explore the feasibility of fuel sales on or near the reservoir. The Utah Division of Parks and Recreation should work with the Water District to determine the scope of concession services that should be provided.

A maintenance yard should also be provided on the south end of the west dam. This facility can be used for maintenance of agency equipment and for storage of boats, OHVs, and other items.

Finally, a dry-dock should be constructed below the west dam. This area will provide for private storage of boats, PWCs and other watercraft.

5. *Day Use Areas*

Four separate day use areas will be constructed on the reservoir's southeastern section. These proposed locations capitalize on the reservoir's sparsely vegetated, sandy terrain and should provide excellent access to the reservoir's best beach areas. Moreover, these areas should be designed with enough flexibility to accommodate use in fluctuating lake levels. As recommended earlier, these areas should include shade/shelter structures, picnic areas, adequate parking and adjacent restrooms.

One of these four day-use areas should be accessible to OHV users from Sand Mountain. This would be located near the reservoir's south shore with access from the proposed Sand Mountain OHV campground/staging area. Team members recommend that OHV use near the reservoir be limited to this day use area to avoid conflicts with reservoir users.

6. *Miscellaneous: Roads, Fencing, Contact Stations*

Access to reservoir facilities should be through a minimum number of entrance/exit points. This is needed to provide adequate law enforcement, avoid illegal trespass and ensure more efficient/equitable fee collection. Two contact stations should be constructed: the main station near the marina area on the reservoir's west side and the other near the group camping area on the east side. All reservoir sites should be accessed from these points. As external "commuter" roads will be developed to provide access to private development near the reservoir, an independent interior road system will need to be constructed around the reservoir's southern half to control access (see Plate 7: *Proposed Facilities*). Likewise, adequate fencing will need to be installed around the park's perimeter (especially along the "commuter" roads) to prevent illegal access and potential conflicts with users as well as adjacent private landowners.

Proposed Sand Mountain Facilities

1. *OHV Campground*

A 25-site OHV campground and associated parking/staging area should be provided at the sand dune/slickrock area south of the proposed road near the reservoir's south end (see Plate 7: *Proposed Facilities*). This site, located at the base of Sand Mountain's major dune area, will provide OHV-based campers with easy access to the area's major motorized attractions. Moreover, its close proximity to Sand Mountain will also reduce conflict with different types of use such as boaters or water-based visitors. The site will also serve as a major staging point for OHV day users wishing to access the primary dune area.

This area is located on BLM's Sand Mountain SMRA. There are two small parcels of private land located in section 36, T. 42 S., R. 14 W. that would be in or near the preferred location of the campground/staging area (see Plate 5: *Land Ownership*). As mentioned above, these parcels should be accurately identified to evaluate if they could be acquired or if their location would affect facilities development in this area.

Assuming that these lands are not federally owned, a joint effort between State Parks and BLM will be required to negotiate their purchase. The team feels that the Water District should not be encumbered with paying for this area. Consequently, the Utah Division of Parks and Recreation would be responsible for acquiring these lands and managing this site. Again, if such parcels cannot be acquired, OHV use/access would be permitted at the proposed Beachfront Campground listed on pp. 50-51 above.

As noted earlier, the campground should be relatively primitive with designated camp sites (some useable by large R.V.s), all-weather travel surface, defined perimeter boundary, garbage and flush restroom facilities with showers, adequate shade structures, and informational signing.

The campground and associated staging area should be accessed from the proposed contact

stations via the park's interior roads. A structure (e.g., box culvert) should be constructed to provide full size vehicle and trailer access from the reservoir area under the main commuter road. As noted above, OHV users would be allowed to access a designated reservoir day use area adjacent to this proposed structure. However, OHVs would be confined to this location near the reservoir to minimize user conflict.

An informational area with posted regulations and map availability should be provided at the OHV campground/staging area. Visitors would be notified that this is a multi-user recreation area where both motorized and non-motorized recreation is acceptable. Users having a specific conflict with motorized use would be informed of other areas where motorized use is not allowed and their recreational expectations can be fulfilled. Motorized users would be advised of proper etiquette for non-motorized users such as equestrian, mountain biking, and hiking. The Utah Division of Parks and Recreation will need to work closely with the BLM as well as user groups to formulate rules and regulations governing motorized use in this area.

2. *Dispersed Staging Areas*

As mentioned above, two areas on BLM property were identified as proposed remote or "dispersed" staging areas: one located at the Washington Dam access on the area's west side; and the second, south of Hurricane, Utah on the east side of the proposed recreation area (Refer to Plate 6: *Potential Recreation Opportunities*). These staging areas will need to accommodate both equestrian, motorized and other non-motorized users. An easy access-route from the Washington Dam staging area may need to be identified and provided. Staging areas should provide adequate parking space, informational signing, an all-weather surface (preferably graded gravel), boundary fencing, restrooms and garbage facilities.

As mentioned above, information/maps regarding trails, distances, regulations, etiquette, points of interest, linkages to other locations and recommended areas most suitable to each major user group should be provided.

3. *Explore potential opportunities for a separate equestrian campground.*

As recommended earlier, BLM , the Utah Division of Parks and Recreation and equestrian groups should evaluate the need for a potential equestrian campground. Concern was expressed about the potential conflicts between motorized and equestrian use in the proposed OHV-based campground near Sand Mountain. Other Sand Mountain locations should be evaluated as potential locations.

CONCLUSION

This plan is a blueprint to help implement the planning team's recommendations. As such, it outlines the initial steps to be taken in concert with users, local communities and other interested parties to provide needed programs, effectively educate visitors, enhance customer service and properly develop facilities to meet the park's wide ranging user needs.

The recommendations contained in this plan conform to the team's mission of providing visitors a safe, satisfying recreational experience, developing facilities that meet user needs and enhancing the area's aesthetic values while minimizing conflict and congestion. This central theme was considered with the development of each recommendation.

The plan's recommendations effectively deal with current trends concerning day use, facility needs and enhancement of education/interpretation efforts. However, it is crucial that adequate funding be received to implement these goals and accommodate visitor needs. As stated earlier, the plan's success is dependent upon the continued support of park stakeholders. Stakeholders must continue their efforts to interact with local communities and strive to meet the expectations of park visitors in the midst of a rapidly growing community of recreation-oriented citizens. The recommendations contained within this plan were based upon an open and collaborative process. It is imperative that this collaborative spirit continue as the plan's components are implemented.

It is also imperative that the document be reviewed on a regular basis to ensure its viability, relevance and usefulness. This document has sufficient flexibility to be amended in response to changing resource conditions, visitor needs and expectations, community needs and agency priorities. Such amendments may occur under the guidance of The Washington County Water Conservancy District, the BLM St. George Field Office or the Utah Division of Parks and Recreation working in conjunction with local communities or users groups. Any such changes will include input from park visitors, local citizens, community leaders, park management or other stakeholder with interests relevant to the operations and maintenance of the park.

References

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APPENDIX A

Sand Hollow Recreation Area Potential User Survey Report

Sand Hollow Recreation Area Potential User Survey Report

March 2001

STATE OF UTAH
NATURAL RESOURCES
Division of Parks & Recreation

Sand Hollow Recreation Area
Potential User Survey Report

March 2001

Conducted by:
Utah Division of Parks and Recreation

For further information on this report or on the visitor survey, contact Jamie Dalton, Research Consultant, at (801) 538-7311 or Rosalind Bahr, Parks Planner, at (801) 538-7340 or email nrdpr.jdalton@state.ut.us and nrdpr.rbahr@state.ut.us respectively.

Potential User Survey 2001

Sand Hollow Recreation Area

Report Summary

- ✓ This summary presents only a portion of the results from the Sand Hollow Recreation Area (SHRA) Potential User Survey. It is necessary to read the complete report to properly use and to understand the process and limitations of the survey.

- ✓ This report describes the results of the potential user survey for SHRA conducted January 3 - March 5, 2001. The sample is comprised of individuals selected from groups with a specific recreation interest including boating, riding OHVs, camping, riding horses, hiking, fishing and biking. Results provide a fairly representative view of potential users to SHRA, with the understanding that determining future use is always more difficult than analyzing use at an existing facility. An initial contact was made by letter explaining the potential recreation area and purpose of the survey. It included a request for completing and returning the enclosed survey. Two follow-up mailings were used to increase the number of questionnaires returned. A total of 885 questionnaires were mailed out with 636 returned. The was response rate was 71.9%.

- ✓ Approximately 80% of respondents are very likely to visit or definitely will visit SHRA. Of those, 60.4 % stated they definitely will visit the recreation area.

- ✓ Respondents primary outdoor activities based on participation are picnicking (68.4%), camping without hookups (67.5%), hiking (67.5%), swimming (63.4%), fishing from a boat (62.6%) and from shore (60.5%) and boating (52.4%) including pleasure boating, waterskiing, etc.

- ✓ The most important recreation opportunities respondents would like to see provided at SHRA include picnicking, camping without hookups, hiking, solitude, swimming, fishing from a boat and from shore, and boating including pleasure boating, waterskiing, etc.

- ✓ The most important facilities respondents would like to see provided at SHRA include boat launch facilities, single unit day use sites, walking/hiking trails, campsites without full hookups, a group use area, and paved parking areas.

- ✓ Respondents stated that the activities most likely to cause interference with their desired recreation experience are people driving boats fast, people riding personal watercraft (PWCs), having private development within one mile, and people riding off-highway vehicles (OHVs).

- ✓ Almost half (49.8%) of respondents indicated they would stay between ½ and 1 full day when visiting SHRA. Overnight use of two days or more comprised 42.5% of responses.

- ✓ Eighty percent of respondents stated they would support the Division of Parks and Recreation as the management entity for SHRA.

- ✓ The preferred fee range for day use access to SHRA was $1 - $5, and the preferred fee range for camping with full hookups was $11 - $15.

- ✓ The average estimated amount respondents would spend on their total trip to SHRA was $178.52. Respondents estimated they would spend $182.02 in Washington County for trip related expenditures.

- ✓ Average group size for respondents was 6.7 people.
- ✓ The average age of respondents is 49.3 years old. Just under a majority of respondents (49.0%) are between the ages of 40 and 59.
- ✓ The most common income bracket for respondents is $50,000 to $74,999, however, the income bracket $25,000 - $49,999 was just slightly less.
- ✓ Fifty-six percent of respondents were from Washington County. Respondents from Salt Lake County were the second largest group of respondents with 10.1%. Twenty-two Utah counties and seven states outside Utah were represented.
- ✓ At the end of the survey, respondents were given the opportunity to provide additional comments. The most common category of responses was *********. Other categories with high numbers of responses were **********.

TABLE OF CONTENTS

INTRODUCTION

This preliminary report describes the results of a survey administered for the Sand Hollow Recreation Area. This survey was administered January 3 - March 5, 2001 by the Utah Division of Parks and Recreation. The **Survey Purpose** describes the reasons for conducting the study and the purposes for which the results will be used. The **Methods** section describes the survey instrument, sampling period, survey distribution, sample numbers, data analysis, and limitations to the survey. The **Data Interpretation** section briefly describes the type of figures used to display the results of the study.

SURVEY PURPOSE

The purpose of this study was to obtain a better understanding of potential users to Sand Hollow Recreation Area including their potential use, interests, needs, and preferences. Components of this survey, in conjunction with a variety of other data sources, will be used to guide the decision making process for future management of the recreation area .

METHODS

Survey Instrument

The survey instrument for this study consisted of an eight page questionnaire. The questionnaire was designed to address four main areas: (1) *Recreation Interests and Potential Visit Information,* (2) *Opportunities, Facilities and Experience Interference,* (3) *Economics,* and (4) *Demographic Information.* The instrument included different question formats and scale types to assist in the accuracy of the analysis. A copy of the questionnaire is included in Appendix C of this report.

Sampling Frame

The sampling period for mailing questionnaires and receiving responses was January 3 - March 5, 2001. The sample included individuals with specific recreation interests and a broad representation of groups was included. The recreation activities represented were boating, riding off-highway vehicles, camping, riding horses, hiking, fishing, and bicycling. The data reflects interests and opinions of the specific user groups from which the sample was pulled, but due to the broad representation of interests, the compiled results are fairly representative of potential users to the park. It should be noted that it is more difficult to sample a potential user group than an existing user group and the data in this report is based on a projected user group.

Sample Selection

Individuals for participation were randomly selected by computer when the population was greater than 200. For populations less than 200, the entire population was included in the survey. The population for boaters and those interested in riding OHVs was a list of all registered owners in the state. The population for campers was drawn from individuals that made a camping reservation at Quail Creek in 2000. Populations were used for the Backcountry Horsemen, Outback Hiking Club, Southern Utah Anglers, and Bicycle Utah. Duplicates were removed to provide each individual with a single opportunity to be selected for participation.

Survey Distribution

A database of names was created that included the randomly selected participants from the potential user lists described previously. This database was used for each of three mailings to participants.

Potential users included in the database were mailed an introductory letter, questionnaire and postage-paid return envelope. This packet was designed to provide background information about the Sand Hollow Recreation Area and introduce the survey and need for responses. One week after sending the questionnaire, a combination reminder/thank you card was sent to each survey participant. If responses had not been received within two weeks of mailing the postcard, another letter, questionnaire and postage-paid return envelope were sent out as a final reminder. A copy of the mailing letters can be found in Appendix B.

Sample Numbers

Sample sizes of approximately 200 participants, when possible, were obtained within each recreation activity group in order increase the opportunity for analysis within groups along with an overall analysis. Without knowing actual visitation to Sand Hollow Recreation Area it is necessary to base the number of returned surveys needed at the maximum level for accepted survey procedures. The standard number of returned surveys needed for large populations is 381. Using this number, 636, provides for an overall sampling error of no more than ±5 percent at the 95 percent confidence level (Salant & Dillman, *How to Conduct Your Own Survey*, 1994) at all levels of potential use. Eight hundred and eighty-five questionnaires were distributed with 636 returned for a 71.9% response rate. The response rate and total numbers indicate that any sampling error has been minimized.

It should be noted that additional mailing lists were requested from various individuals in an attempt to obtain 200 participants within each recreation activity area. The mailing lists were either unavailable or were not provided creating a varying number of participants within each activity group. The total combined responses are fairly representative as many of the respondents have multiple interests and represent interests that were not available on any sampling list.

Data Analysis

SPSS by SPSS Inc. was used to analyze the quantitative results of the questionnaire. Frequency distributions were calculated for the data and responses to open-ended questions were categorized and summarized. Average values were calculated in appropriate situations. Word Perfect was used to compile and summarize the open-ended comments.

Limitations

This survey has some limitations in its applications and its ability to generalize about potential Sand Hollow Recreation Area users as a whole. The data reflects visitor use patterns and opinions for the specific groups reached. However, the combination of the various groups is as representative a sample as can be obtained when surveying a potential user group. The results are considered valid for potential visitors to Sand Hollow Recreation Area with ±5 percent at the 95 percent confidence level based on the number of surveys returned, the variety of user groups included in the sampling, and the overall response rate.

DATA INTERPRETATION

Explanation

Graphs are used for displaying most of the results in this study. Headings for each section and question are similar to the issue or question in the questionnaire. Below each heading a brief textual analysis of the results is provided. The open-ended questions are summarized in the main body of the document. Complete verbatim responses are categorized in Appendix A.

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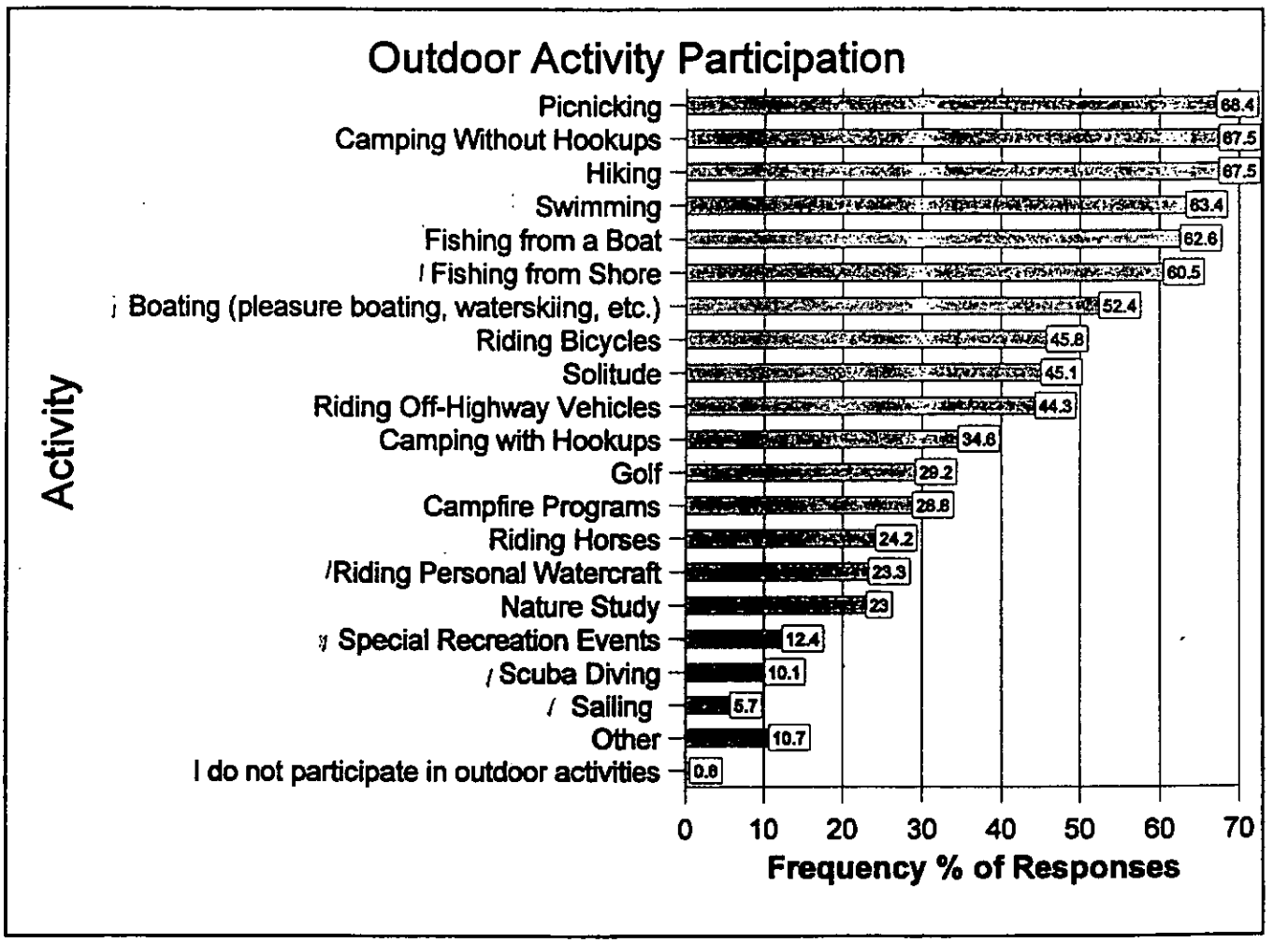
RESULTS
SECTION 1: RECREATION INTERESTS AND POTENTIAL VISIT INFORMATION

Outdoor Activity Participation

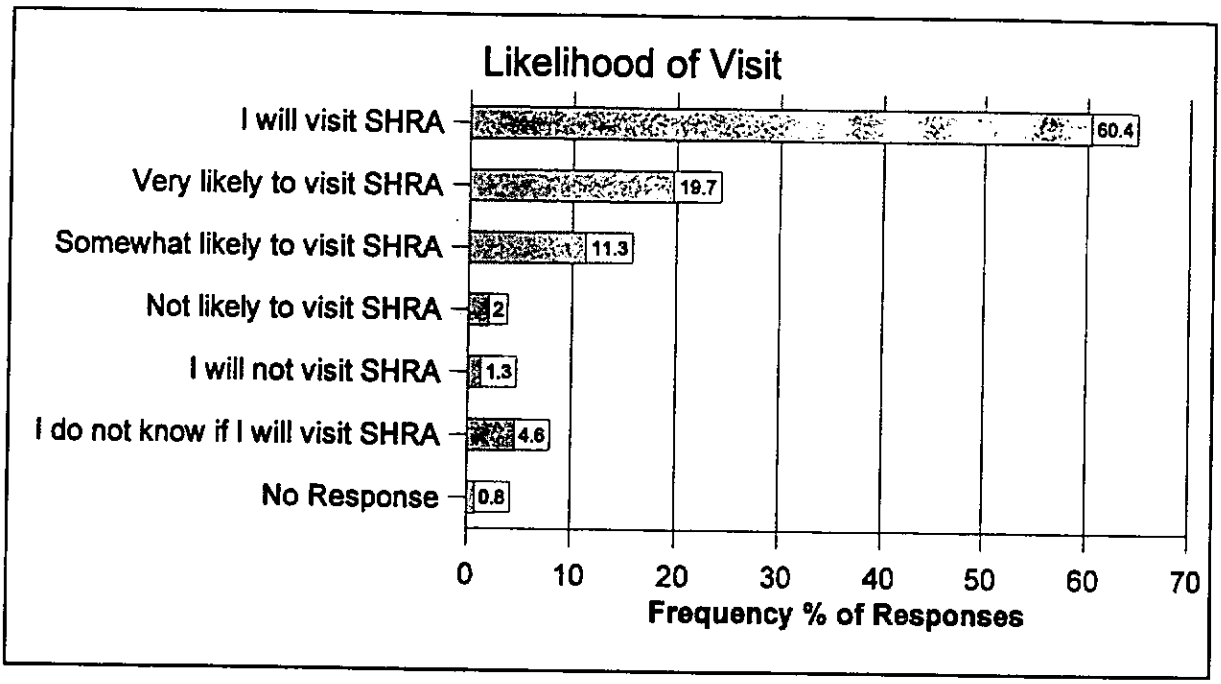
The questions this data was compiled from asked respondents to select all outdoor activities in which they participate. Those activities that had over half of the respondents participating are picnicking (68.4%), camping without hookups (67.5%), hiking (67.5%), swimming (63.4%), fishing both from a boat (62.6%) and from shore (60.5%), and boating which includes pleasure boating, waterskiing, etc. (52.4%).



Note: Percentages total more than 100% as multiple responses were accepted.

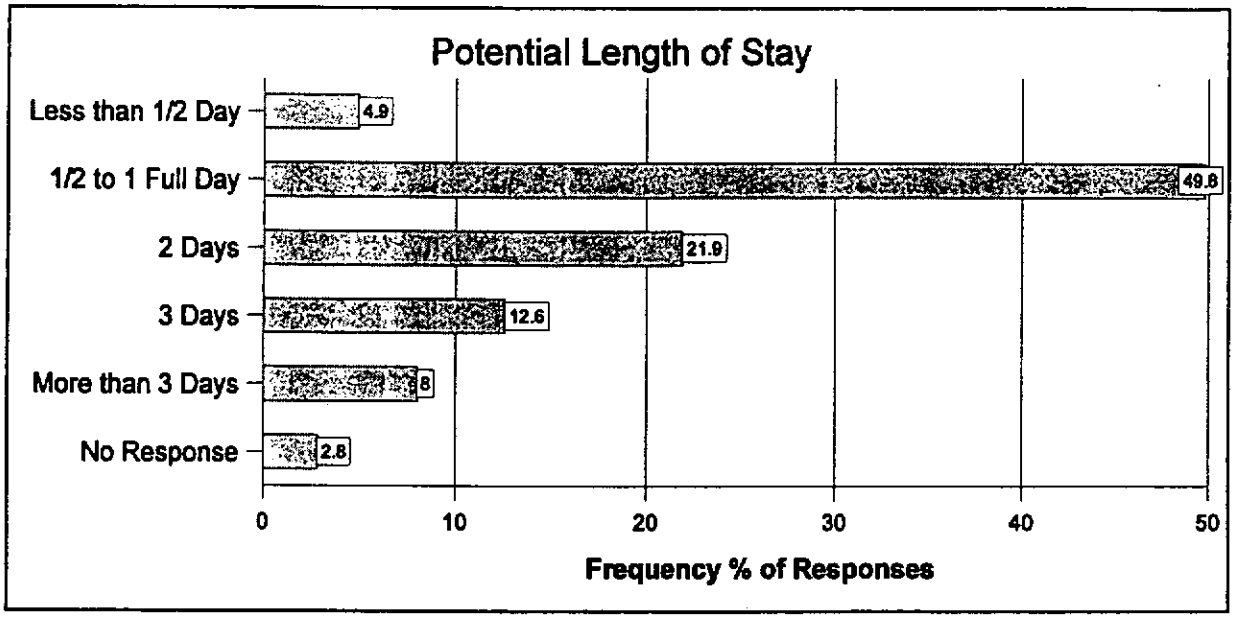
Likelihood of Visiting the Park

In a question asking how likely respondents are to visit Sand Hollow Recreation Area, over 60% of respondents stated that they will visit the recreation area compared with 1.3 who stated they would not visit the recreation area. Of the remaining respondents, almost 20% state they are very likely to visit Sand Hollow Recreation Area.



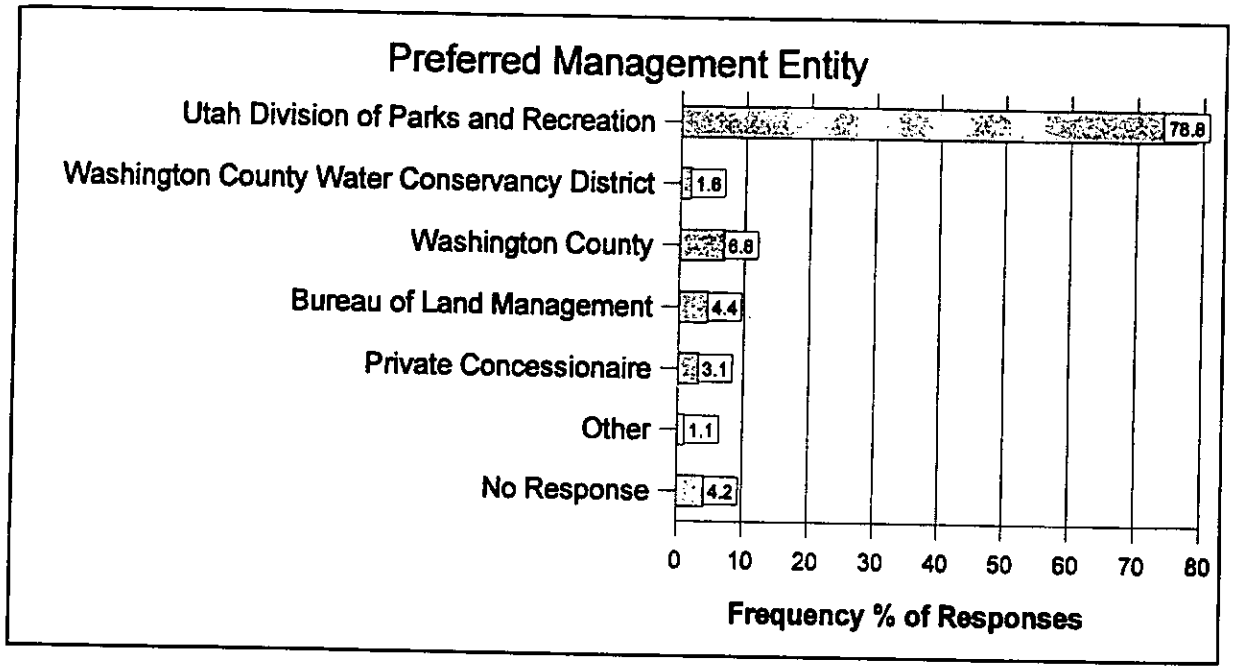
Potential Length of Stay During Visit

Almost half of the respondents (49.8%) indicated that they would stay between one-half and one full day when visiting Sand Hollow Recreation Area. Overnight use of two days or more comprised 42.5% of responses. These results are based on a question asking respondents to estimate their length of stay if they were to visit Sand Hollow Recreation Area.



Preferred Management Entity

In two separate questions respondents were asked if they would support the Utah Division of Parks and Recreation (State Parks) as the management entity for Sand Hollow Recreation Area and if not who they would prefer. Almost 80% of respondents support State Parks as the management entity for the recreation area. Among those that do not support State Parks, the greatest number would prefer Washington County be the management entity.



Additional Open-ended Comments

At the end of the survey, respondents were given the opportunity to provide additional comments in an unrestricted open-ended format. The most common category of responses was comprised of **********. Other categories with high numbers of responses were **********. Below is a list of major categories, in rank order, with the total number of comments in parentheses. A complete categorized list of the comments can be found in Appendix A.

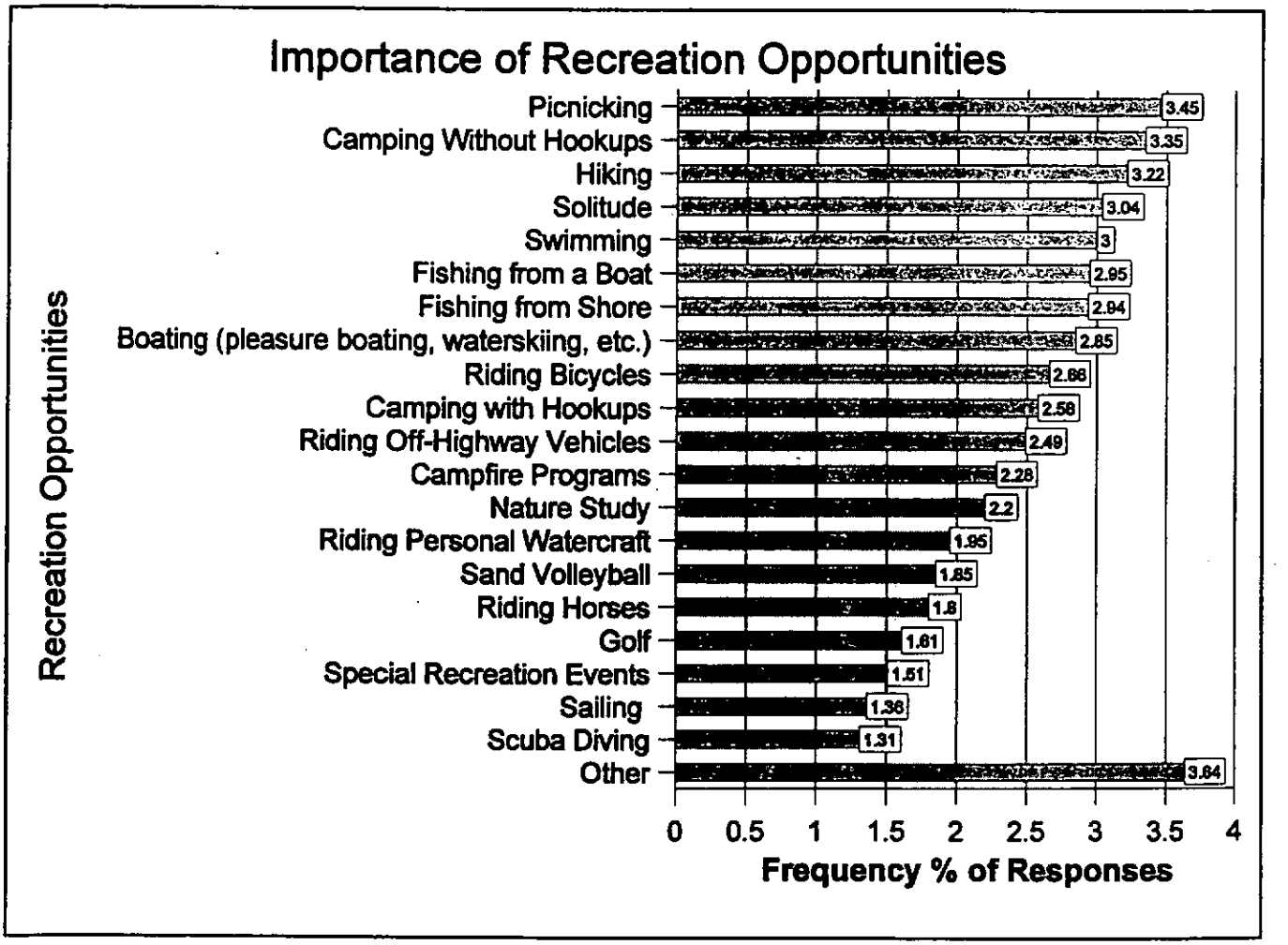
The list of categories and number of responses is as follows:

•

SECTION 2: OPPORTUNITIES, FACILITIES AND EXPERIENCE INFORMATION

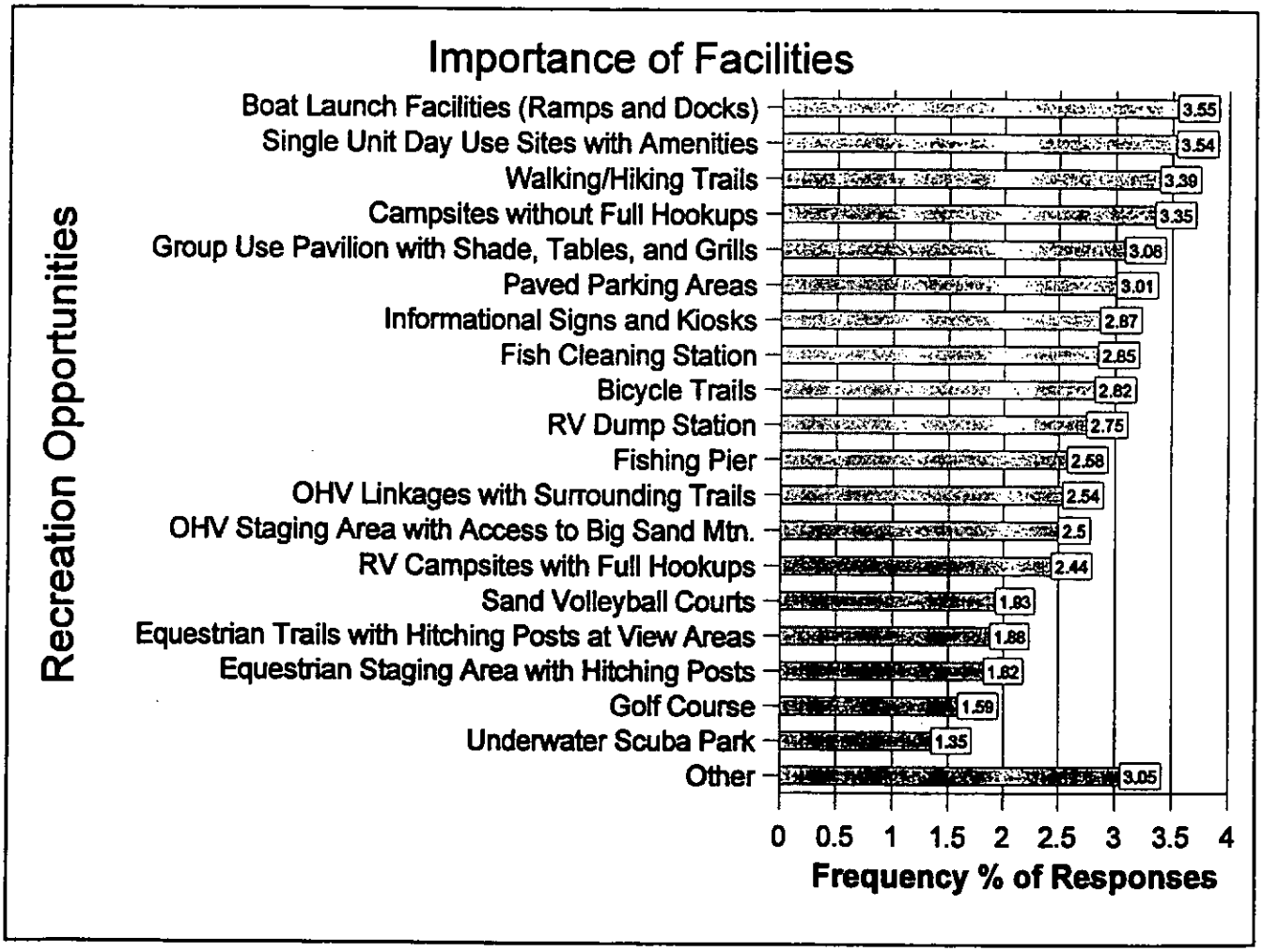
Importance of Recreation Opportunities

The recreation opportunities deemed most important for inclusion in Sand Hollow Recreation Area are picnicking, camping without hookups, hiking, solitude, swimming, fishing from a boat, fishing from shore, boating, riding bicycles, and camping with hookups. This question asked respondents to rate how important it is to them that each of a variety of recreation opportunities be provided at Sand Hollow Recreation Area on a scale of 0-No Opinion, 1-Not Important, 3-Moderately Important, 4- Very Important, and 5-Extremely Important. The results are presented as an average (mean) value. The mean values should be compared to the scale outlined above.



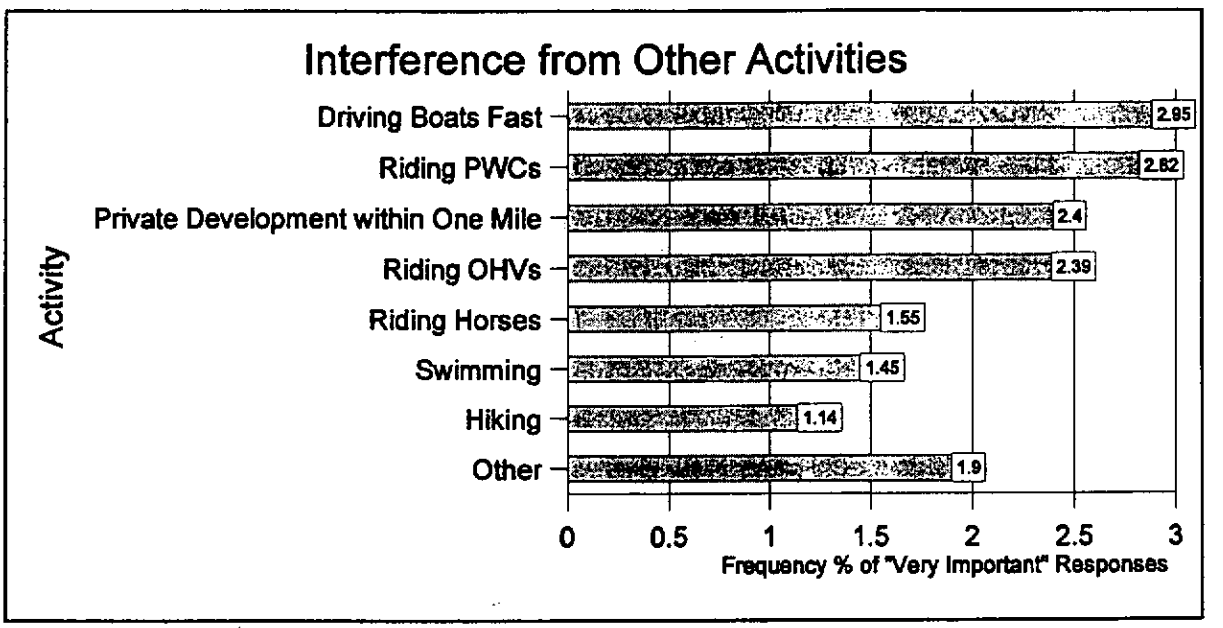
Importance of Facilities

The facilities deemed most important for inclusion in Sand Hollow Recreation Area are boat launch facilities, single unit day use sites, walking/hiking trails, campsites without full hookups,a group use area, and paved parking areas. This question asked respondents to rate how important it is to them that each of a variety of facilities be provided at Sand Hollow Recreation Area on a scale of 0-No Opinion, 1-Not Important, 3-Moderately Important, 4- Very Important, and 5-Extremely Important.. The results are presented as an average (mean) value and should be compared to the scale outlined above.



Level of Interference Other Activities and Features

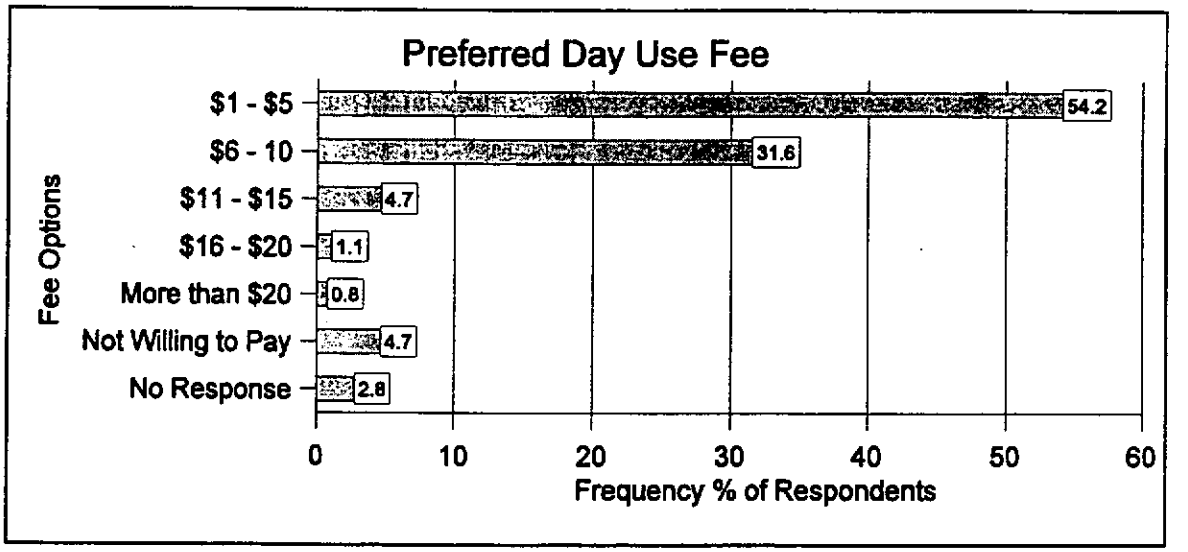
Respondents were asked to rate the level of interference they would experience if they encountered various other recreational activities. The rating scale was 0- No Opinion, 1- No Interference, 2-Low Interference, 3-Moderate Interference, and 4-High Interference. The activities with the highest ranking for interfering with other activities are driving boats fast, riding personal watercraft, having private developments within one mile of the recreation area, and riding off-highway vehicles. These activities rated between low and moderate interference as an average value.



SECTION 3: ECONOMICS

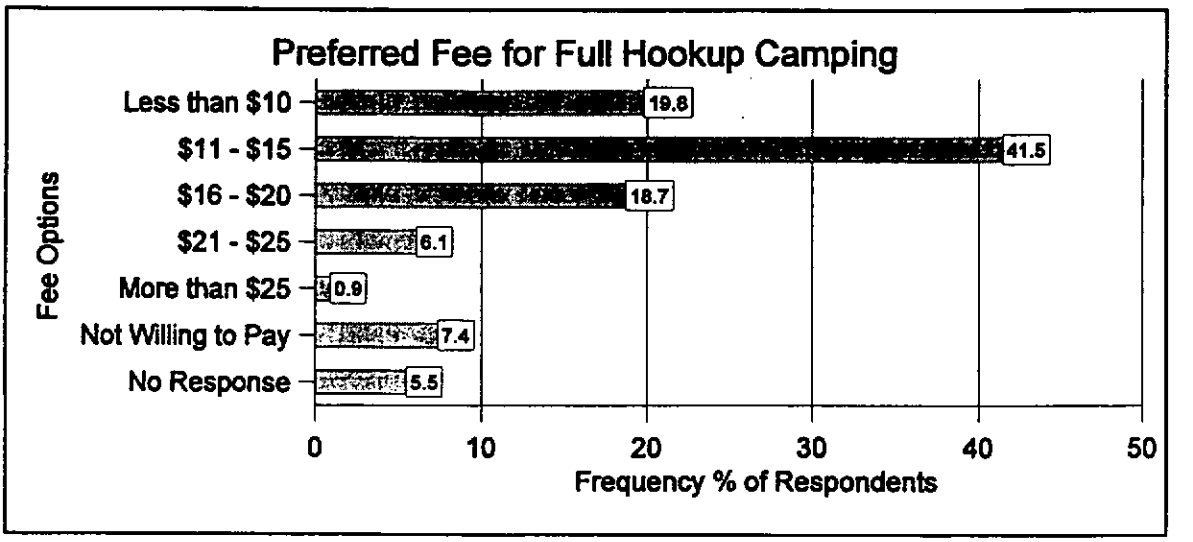
Preferred Range for Day Use Fees

Approximately 86% of respondents would prefer the day use fee be ten dollars or less and 54.2% of those people would like to see the fee be five dollars or less.



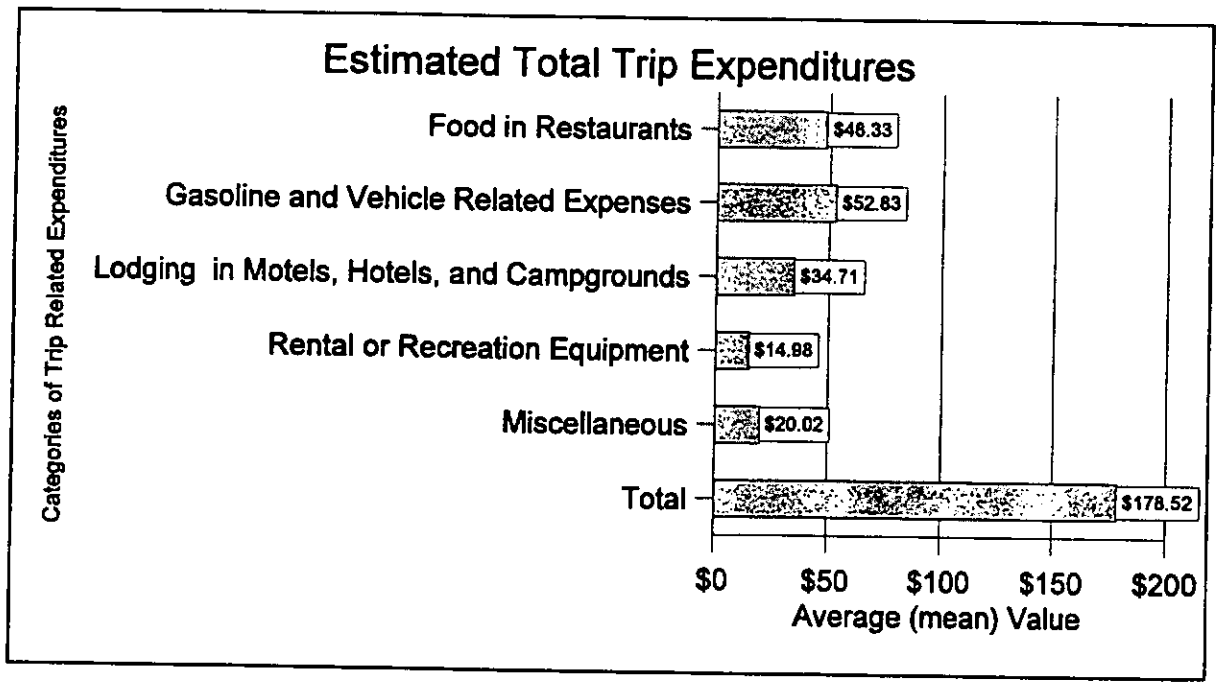
Preferred Fee Range for Camping with Full Hookups

Over 40% of respondents would prefer the camping fee for sites with full hookups be between eleven and fifteen dollars with 80% of respondents preferring the fee be twenty dollars or less.



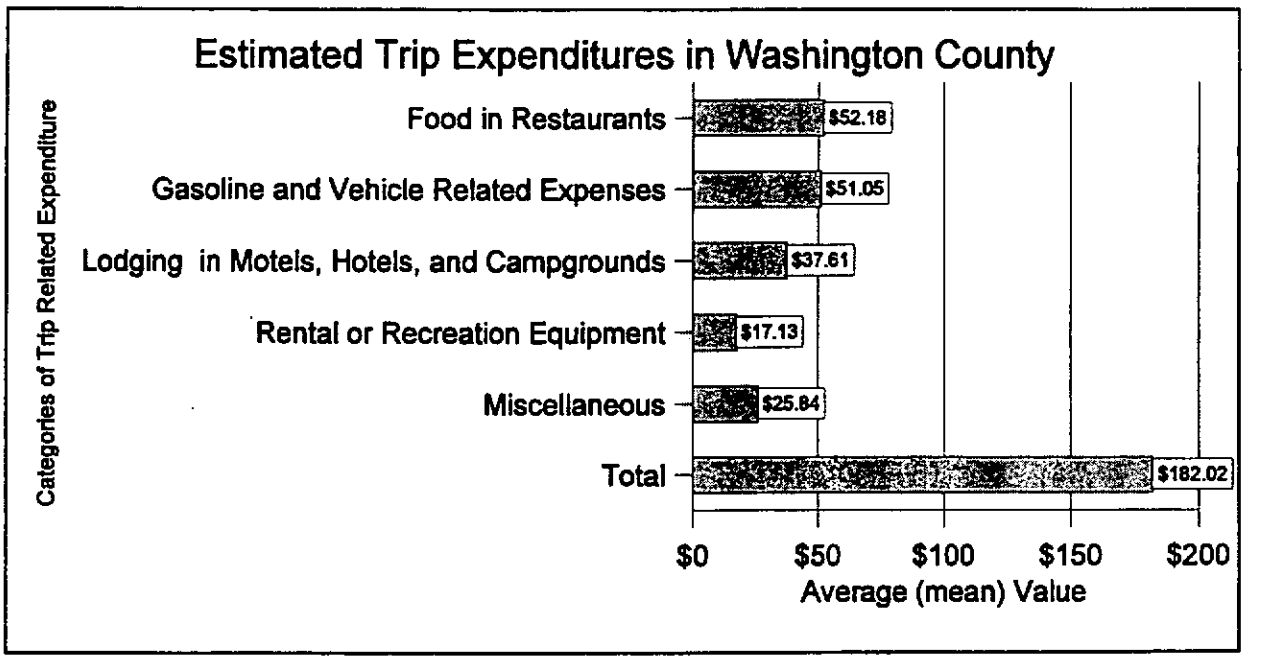
Estimated Total Trip Expenditures

The average total amount spent per response (each response represents an entire group) was $178.52. There is a high standard deviation for this value showing a lot of variance in values. This holds true for the specific categories as well. The values were calculated with non-responses removed.



Estimated Trip Expenditures in Washington County

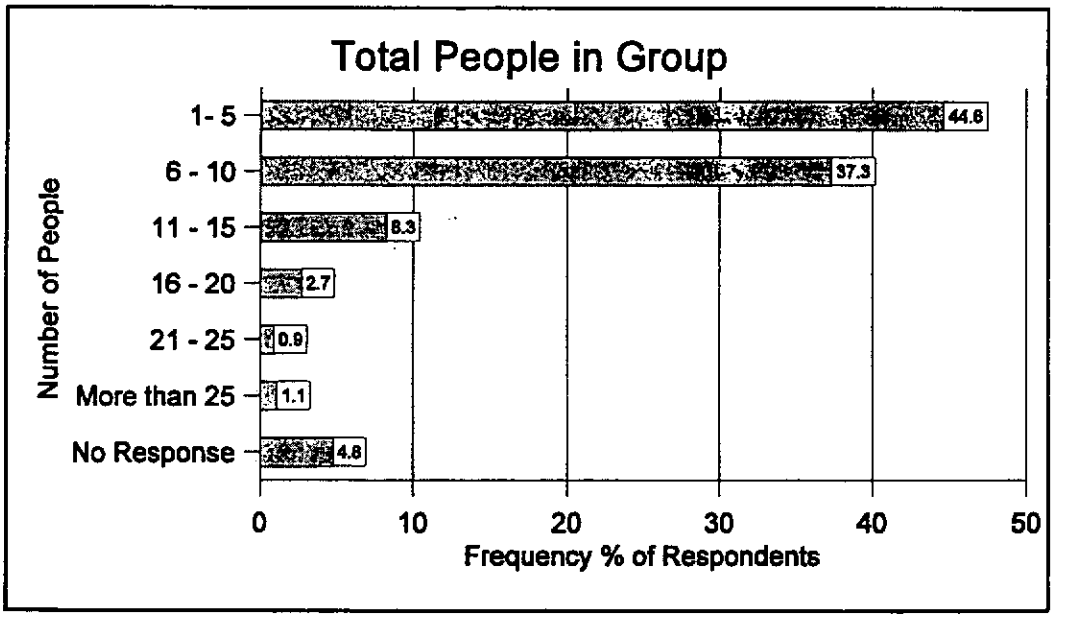
The average total amount spent per response (each response represents an entire group) was $182.02. There is a high standard deviation for this value showing a lot of variance in values. This holds true for the specific categories as well. The values were calculated with non-responses removed.

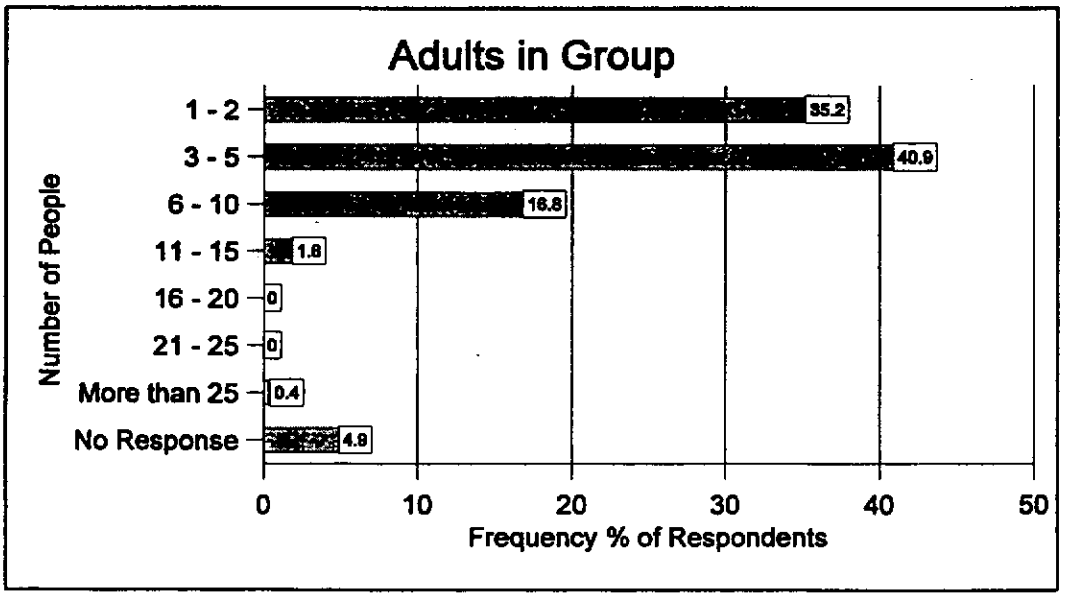


SECTION 4: DEMOGRAPHICS

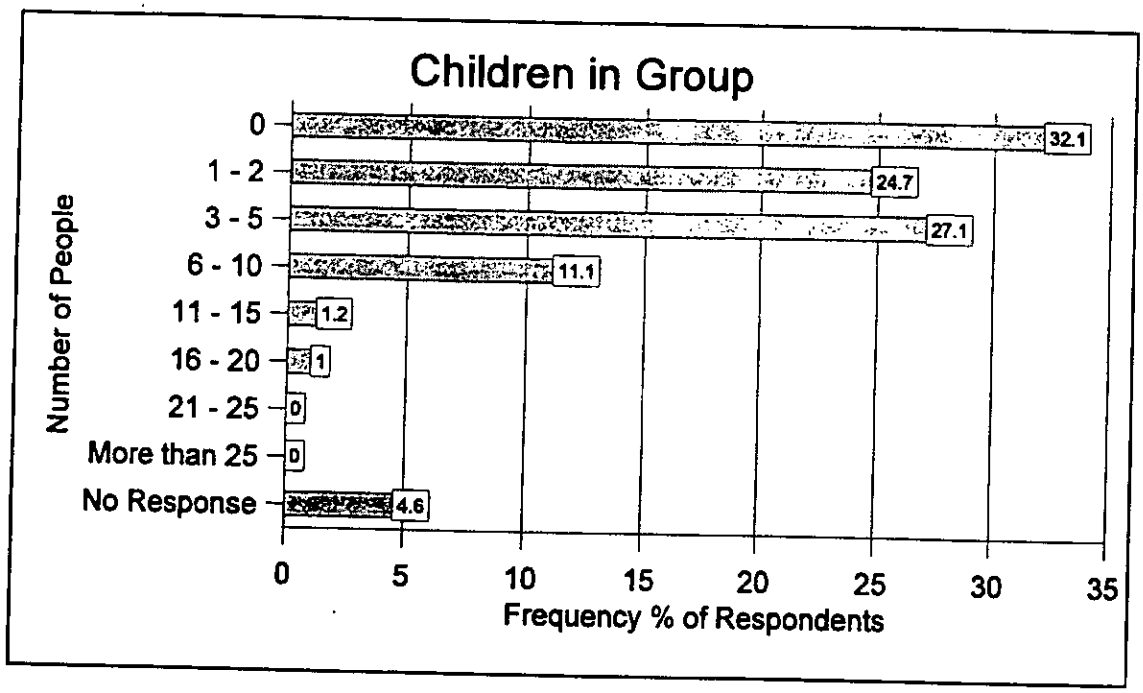
Group Size

The average group size for respondents was 6.7 people. The most common group sizes were four, two and six respectively. The most common group sizes for adults were two, four and six with the average being four. The most common group sizes for children were zero and two with the average being 2.7. Please note the changing sizes of the categories in the charts below. Group sizes ranged from one to forty-two people.



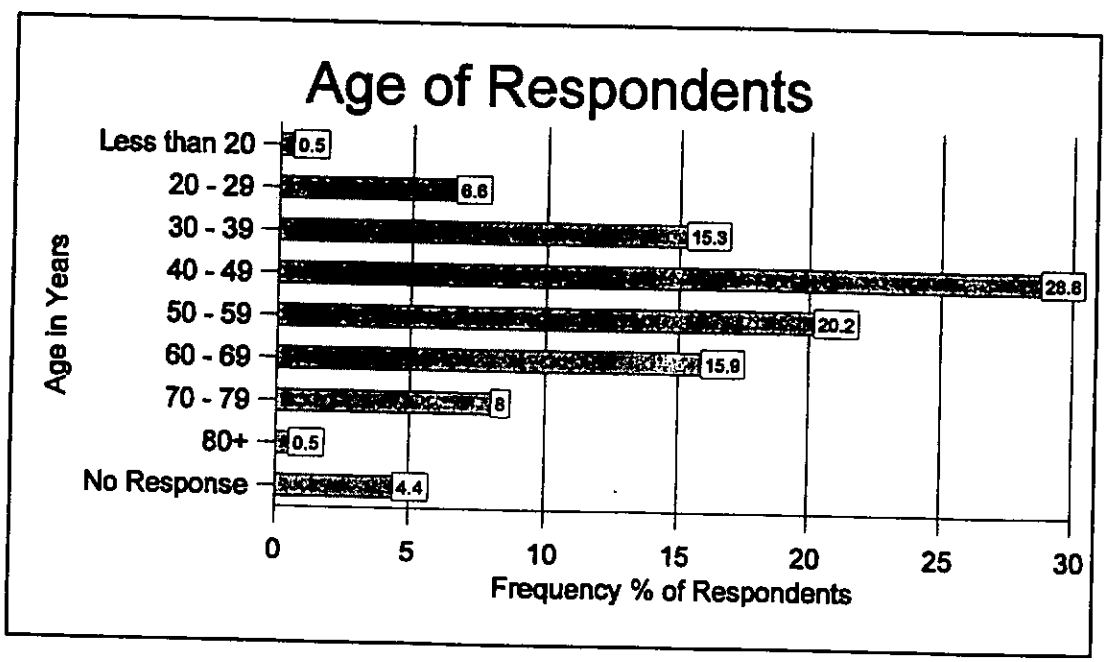


Group Size (continued)



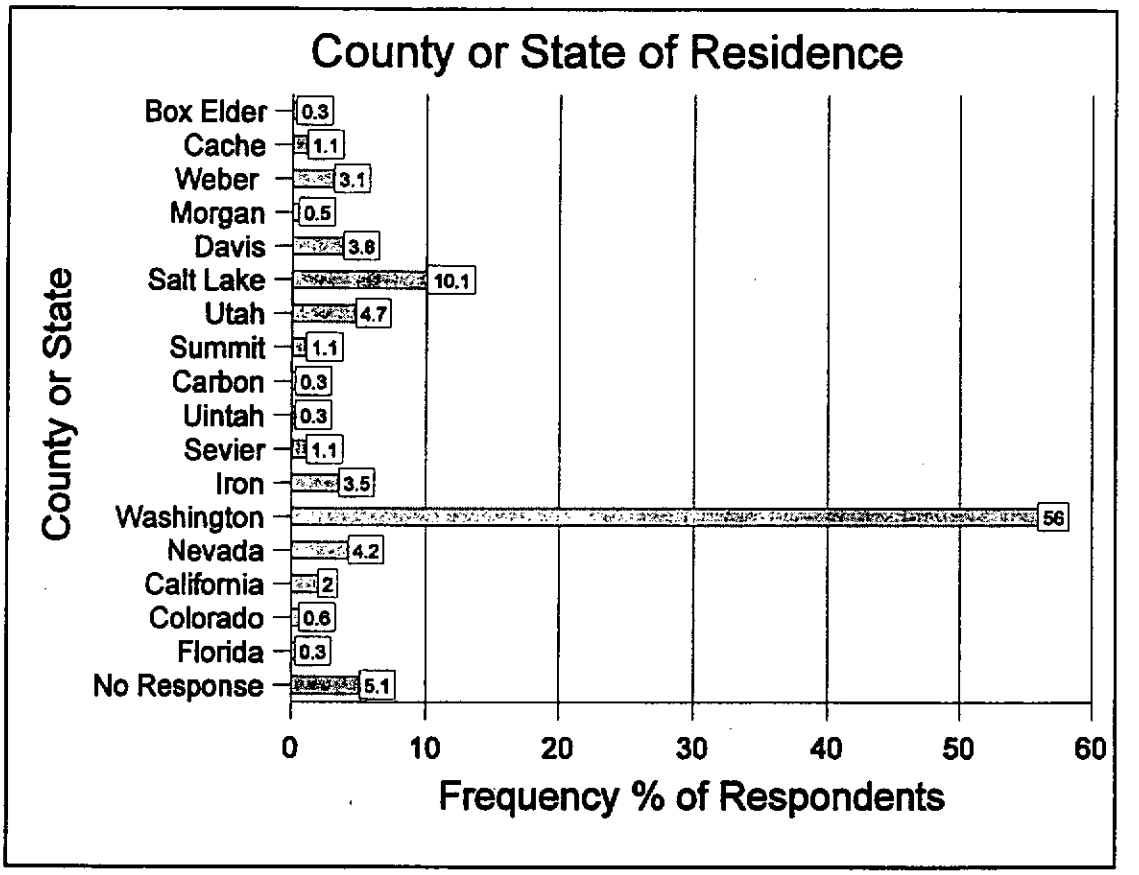
Age

The average (mean) age among respondents is 49.3 years old. The age group with the highest number of respondents is from 40 to 49 years. Respondents between the ages of 40 and 59 years comprise almost half of all respondents (49.0%).



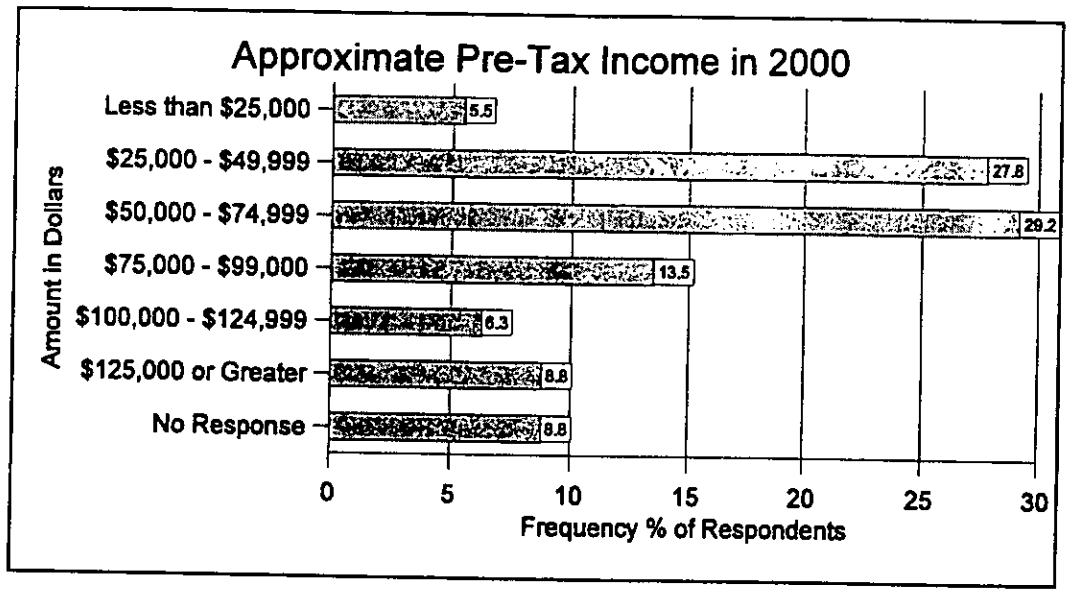
County or State of Residence

A vast majority of respondents were from Washington County (56.0%). Respondents from 22 Utah counties and seven other states were included. Counties and states with a single response include Tooele, Wasatch, Sanpete, Millard, Grand, Beaver, Wayne, Garfield, Kane, Washington, DC, West Virginia, and New York.



Approximate Household Pre-tax Income in 2000

The number of respondents with incomes $25,000 - $49,999 and $50,000 - $74,999 is almost equal and comprises 57% of the total responses.



APPENDICES

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APPENDIX A: ADDITIONAL COMMENTS

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APPENDIX B: MAILING LETTERS

Mailing Letter #1

January 3, 2001

John Doe
2525 Anywhere Street
Salt Lake City, UT 84114

Dear Mr. Doe,

A cooperative planning effort between the Washington County Water Conservancy District, the Bureau of Land Management and Utah State Parks and Recreation is currently developing a recreation plan for a proposed reservoir and recreation area in Washington County, the Sand Hollow Recreation Area. The planning team is comprised of community citizens with a particular specialty who represent different interest groups in the process. As this is a new facility being developed, those involved with the planning process would like to know what facilities and recreation opportunities potential users, like yourself, would like to see included in the Sand Hollow Recreation Area. This survey is your chance to have direct input into the Recreation Plan and the management direction of the proposed Sand Hollow Recreation Area.

You are one of a limited number of potential visitors to Sand Hollow Recreation Area who are being asked to give their preferences and opinions in this survey. Although our sample is small, relative to the number of people who could potential visit the recreational area, it is scientifically designed to represent the thinking of all recreational users. Therefore, it is important that your questionnaire be completed and returned. A postage-paid return addressed envelope is enclosed for your convenience.

You may be assured of complete confidentiality. The questionnaire has an identification number that is used for mailing purposes only. We will check your name off the mailing list when your questionnaire is returned. Your name will never be placed on the questionnaire or linked with your responses in any way.

I would be happy to answer any questions you may have about this survey. Please write me at the letterhead address, or call (801) 538-7340. We deeply appreciate your time and assistance.

Sincerely,

Rosalind Bahr
Parks Planner

enclosures

Postcard Thank You/Reminder

Last week a questionnaire regarding your opinions about the proposed Sand Hollow Recreation Area was mailed to you. You were selected from a random sample of people who could potentially use Sand Hollow.

If you have already completed and returned the questionnaire, please accept my sincere thanks. If not, please do so as quickly as possible. Because it has been sent to only a small but representative sample it is extremely important that your questionnaire be returned.

If you did not receive the questionnaire, or it has been misplaced, please call right away and I will send you another one today.

Sincerely,

Rosalind Bahr
Parks Planner
(801) 538-7340

Mailing Letter #2

January 24, 2001

John Doe
2525 Anywhere Street
Salt Lake City, UT 84114

Dear Mr. Doe,

About three weeks ago I sent you a questionnaire regarding the facilities and recreation opportunities you would like to see provided at the proposed Sand Hollow Recreation Area. As of today, we have not yet received your completed questionnaire.

We have undertaken this survey because people like you who could use Sand Hollow Recreation Area should have an opportunity to provide input into the planning process.

I am writing to you again because of the significance each questionnaire has to the usefulness of this study. You were chosen through a scientifically designed process that ensures the accuracy of the Sand Hollow sample. Only a very small percentage of potential recreational users at Sand Hollow are being asked to complete this questionnaire. In order for our results to be truly representative of the opinions of all potential users, your responses are extremely important and it is essential that your questionnaire be returned.

In the event that your questionnaire has been misplaced, a replacement is enclosed with a postage paid return addressed envelope.

Your cooperation is greatly appreciated.

Sincerely,

Rosalind Bahr
Parks Planner

APPENDIX C: SURVEY INSTRUMENT

Sand Hollow Recreation Area Potential User Visitor Survey Questionnaire

Sand Hollow Recreation Area Public Input Survey

Please fill out this survey as completely as possible and return it in the addressed postage paid envelope. The Washington County Water Conservancy District, the Bureau of Land Management and the Utah Division of Parks and Recreation recently initiated a planning process to develop a multi-purpose recreation area for boaters, off-highway vehicle users, campers, picnickers, and other potential users. The information you provide will be used to help in a joint planning effort between the three agencies listed above, with regards to decisions about facilities, recreation opportunities and management of the recreation area.. Your responses will remain completely confidential (as will your anonymity) so frank responses are appreciated. Please answer each question as is indicated in the individual question instructions. Some questions will ask for a single answer, while others request multiple responses.

This questionnaire consists of questions about your recreation interests and your activity and facility preferences for the proposed Sand Hollow Recreation Area (a reference map is attached to the back of the questionnaire). It also seeks to gather information about the possible economic benefits of the Sand Hollow Recreation Area to Washington County. Please take the time to read each question carefully and answer each question completely. Thank you for your participation.

---

1. Which of the following outdoor activities do you participate in? Please mark **all** boxes that apply.

   - ❑ Fishing from a Boat
   - ❑ Fishing from Shore
   - ❑ Boating (includes pleasure boating, waterskiing, wakeboarding, etc.)
   - ❑ Riding Personal Watercraft (e.g. Jetskis, Waverunners, etc.)
   - ❑ Swimming
   - ❑ Sailing
   - ❑ Picnicking
   - ❑ Camping – Do not need hookups
   - ❑ Camping – Need or prefer hookups
   - ❑ Riding Horses
   - ❑ Riding Off-Highway Vehicles (OHVs)
   - ❑ Scuba Diving
   - ❑ Nature Study
   - ❑ Hiking
   - ❑ Campfire Programs
   - ❑ Special Recreation Events (e.g. Boat or OHV races)
   - ❑ Golf
   - ❑ Solitude
   - ❑ Other (please specify)_____
     _____
   - ❑ I do not participate in outdoor activities.

In preliminary planning phases, some suggestions have been made about recreation opportunities and facilities to be provided at Sand Hollow Recreation Area. In order to determine which of the suggestions you as a potential user believe are appropriate and which ideas we have not considered, please review the following lists and select the options you believe would be appropriate for Sand Hollow Recreation Area. If you have suggestions that are not included, please write them on the "other" line. If you need additional space to answer any question, please feel free to use the back of the questionnaire or attach a separate sheet of paper.

2. For each of the following recreation opportunities please circle the answer that represents how important it is to you that the opportunity be provided at the proposed Sand Hollow Recreation Area? Please **circle** an answer for each opportunity and **write in** any additional opportunities that are not listed in the "other" box.

Recreation Opportunity	Level of Importance					
Fishing from a Boat	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Fishing from Shore	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Boating (includes pleasure boating, waterskiing, wakeboarding, etc.)	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Riding Personal Watercraft (e.g. Jetskis, Waverunners, etc.)	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Swimming	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Sailing	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Picnicking	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Camping – Do not need hookups	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Camping – Need or prefer hookups	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Riding Horses	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Riding Off-Highway Vehicles	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Scuba Diving	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Nature Study	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important

2. Recreation Opportunities Continued - Please continue to circle the response that indicates how important it is to you that each of the following recreation opportunities be provided at the proposed Sand Hollow Recreation Area.

Recreation Opportunity	Level of Importance					
Hiking	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Campfire Programs	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Special Recreation Events (e.g. Boat or OHV races)	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Golf	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Sand Volleyball	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Solitude	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Other (please specify)	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Other (please specify)	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important

3. For each of the following facilities please circle the answer that represents how important it is to you that the facility be provided at the proposed Sand Hollow Recreation Area? Please **circle** an answer for each facility and **write in** any additional facilities that are not listed in the "other" box..

Recreation Opportunity	Level of Importance					
Boat Launch Facilities, specifically ramps and docks	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Campground designed to accommodate large RVs, with full hookups	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Campsites without hookups	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Single Unit Day Use Sites with shade, a picnic table, and a grill	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Group Use Pavilion, including shade, tables and grills	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Paved Parking Areas	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important

3. Facilities Continued - Please continue to circle the response that indicates how important it is to you that each of the following facilities be provided at the proposed Sand Hollow Recreation Area.

Recreation Opportunity	Level of Importance					
OHV Staging Area, including access to Big Sand Mountain	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
OHV linkages with surrounding trail systems	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Equestrian Staging Areas, including hitching posts	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Equestrian Trails, including hitching posts at view areas	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Fishing Pier	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Fish Cleaning Station	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Informational Signs and Kiosks	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
RV Dump Station	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Walking/Hiking Trails	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Golf Course	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Underwater Scuba Park	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Sand Volleyball Courts	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Other (please specify)	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Other (please specify)	No Opinion	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important

4. Do you support management of the Sand Hollow Recreation Area by the Utah Division of Parks and Recreation? (The Division of Parks and Recreation is the managing agency for Quail Creek, Deer Creek, Bear Lake, and Coral Pink Sand Dunes, among others.)

   ❑ Yes (Please go to question 5)
   ❑ No

   4b. If your answer was NO, who would you prefer as the management agency for the Sand Hollow Recreation Area?

   ❑ Washington County Water Conservancy District
   ❑ Washington County
   ❑ Bureau of Land Management
   ❑ Hurricane City
   ❑ Private Concessionaire
   ❑ Other (please specify)_____

In order to maintain the facilities and provide the staff to operate the recreation area, fees will need to be charged for access to the recreation area and for overnight camping?

5. How much would you be willing to pay for a day access to the recreation area including day use facilities and opportunities?

   ❑ $1 - $5
   ❑ $6 - $10
   ❑ $11 - $15
   ❑ $16 - $20
   ❑ More than $20
   ❑ I would not be willing to pay to use the recreation area.

6. How much would you be willing to pay per night in a campground with full RV hookups?

   ❑ Less than $10
   ❑ $11 - $15
   ❑ $16 - $20
   ❑ $20 - $25
   ❑ More than $25
   ❑ I would not be willing to pay to use the recreation area.

7. Given the variety of recreation opportunities possible at the Sand Hollow Recreation Area, please review the following list of activities and select the level of interference, if any, you believe you would experience if you encountered people engaging in that activity. Please select only one response.

Activity/Behavior	Please circle the answer that corresponds best with your feelings about each statement.				
People Swimming	No Opinion	No Interference	Low Interference	Moderate Interference	High Interference
People Driving Boats Fast	No Opinion	No Interference	Low Interference	Moderate Interference	High Interference
People Riding Off-Highway Vehicles	No Opinion	No Interference	Low Interference	Moderate Interference	High Interference
People Riding Horses	No Opinion	No Interference	Low Interference	Moderate Interference	High Interference
People Hiking	No Opinion	No Interference	Low Interference	Moderate Interference	High Interference
People Riding Personal Watercraft	No Opinion	No Interference	Low Interference	Moderate Interference	High Interference
Private Development within One Mile of the Recreation Area	No Opinion	No Interference	Low Interference	Moderate Interference	High Interference

8. How likely are you to visit the Sand Hollow Recreation Area?

- ❑ I will visit Sand Hollow Recreation Area
- ❑ Very likely to visit Sand Hollow Recreation Area
- ❑ Somewhat likely to visit Sand Hollow Recreation Area
- ❑ Not likely to visit Sand Hollow Recreation Area
- ❑ I will not visit Sand Hollow Recreation Area
- ❑ I do not know if I will visit Sand Hollow Recreation Area

Please answer the next four questions as if you were going to visit the Sand Hollow Recreation Area.

9. If you were to visit the Sand Hollow Recreation Area, how many people would you typically include in your group?

_____ ADULTS (18 years and older)

_____ CHILDREN (17 years and younger)

10. If you were to visit the Sand Hollow Recreation Area, how long would you typically stay?

- ❑ Less than ½ day
- ❑ ½ to 1 full day
- ❑ 2 days
- ❑ 3 days
- ❑ More than 3 days

11 Please estimate how much money your group would spend per outing in the following categories if you were to visit the Sand Hollow Recreation Area. Include all expenditure regardless of location related to this outing.

Food, specifically restaurant expenditures.....$_____

Gasoline and other vehicle related expenses .....$_____

Lodging expenses, including hotels, motels, and campgrounds.....$_____

Expenditures for trip related rentals or recreation equipment (for example, boat or OHV rentals or purchases of recreation gear).....$_____

Other miscellaneous trip related expenses.....$_____

12. Please estimate how much money your group would spend per outing in Washington County for each of the following categories if you were to visit the Sand Hollow Recreation Area.

Food, specifically restaurant expenditures.....$_____

Gasoline and other vehicle related expenses .....$_____

Lodging expenses, including hotels, motels, and campgrounds.....$_____

Expenditures for trip related rentals or recreation equipment (for example, boat or OHV rentals or purchases of recreation gear).....$_____

Other miscellaneous trip related expenses.....$_____

13. In which county do you live?

_____

14. Your present age: _____ in years

15. What was your approximate household pre-tax income in 2000?

- ❑ Less than $25,000
- ❑ $25,000 to $49,999
- ❑ $50,000 to $74,999
- ❑ $75,000 to $99,999
- ❑ $100,000 to $124,999
- ❑ $125,000 or greater

16. Do you have any additional ideas or information regarding Sand Hollow Recreation Area that you would like to share with us? (Please write any information and use the back of this questionnaire or attach additional paper as needed.)

Again, the information you provided will be utilized by the Sand Hollow Recreation Area Planning Team and the cooperating agencies to develop a plan for the recreation area that will guide development and management over the next several years
Thank you for participating in this survey!

APPENDIX B

Economic Impact of Recreational Use of the Proposed Sand Hollow Reservoir on Washington County, Utah

AN ANALYSIS OF THE ECONOMIC IMPACT OF RECREATIONAL USE OF THE PROPOSED SAND HOLLOW RESERVOIR ON WASHINGTON COUNTY, UTAH

by

John D. Groesbeck, Ph.D.

Department of Business
Southern Utah University

May 6, 1999

Summary of Results.

The purpose of this study is to determine the economic impact of the recreational use of Sand Hollow Reservoir and its other camping, day and Off Highway Vehicle (OHV) use areas on Washington County, Utah.

Estimating recreational impacts of a new reservoir is a difficult task. In a region where several opportunities already exist for recreation, the impacts of the reservoir should be estimated only on the basis of new recreation, not a redistribution of existing spending away from other venues. However, in a growing region such as the Southwestern Utah/Southern Nevada area, the long run impacts could be much higher as Washington County exports recreational services and trade to persons outside the County, as well as increasing recreational spending among new and existing residents because of the creation of a new opportunity. This must also be viewed in light of the fact that as incomes rise generally, spending on leisure goods has generally increased faster than income growth. Thus, even if populations do not rise in the area, spending and demand for leisure goods will rise at a rate that is faster than income growth. Thus, new supplies of leisure services and goods will need to rise to meet that new demand. The short-run impacts presented will likely occur within five years of completion of the reservoir if reasonable growth in the region continues, and policies governing OHV use do not substantially change.

Long-run impacts of the reservoir will be driven primarily by growth in the area. These impacts assume that the regional demand increases to the point of fully absorbing all of the recreational venues in the region at reasonable levels. For a reservoir the size of Sand Hollow, it could be expected that unduplicated use rates could be higher than those experienced by Quail Creek over the past few years, but possibly less than the enormous use rate in 1998, which was 730,901 visitor days. This study will assume a long-run use rate of 500,000 visitor days per year in order to generate conservative estimates.

Short-run Impact Results. Both short and long-run recreational impacts were generated with the assumption that there would be 200 developed camping sites, and 100 day-use sites developed around the reservoir. Three short-run scenarios of qualified recreational use to the county (50,000, 100,000 and 150,000 visitor days) and three scenarios of total spending per visitor day ($16.00, $21.00 and 26.00) were generated and thus nine possible economic impact outcomes exist depending on these combinations. It is also assumed that the average entrance fee payment per visitor day will be $1.50. Total spending Qualified recreational use is defined as visitation over and above that level of visitation already being enjoyed by the county at other state parks, or the extrapolated social benefit of reducing use pressure on Quail Creek reservoir, the second most used park in the state system of parks for 1998. It is assumed that the most likely outcome combination is the 100,000 visitor days spending $18.50 per visitor day. Short-run impact results are summarized in Table 1 below:

Table 1.

Total Annual Output Impact In Washington County Due To Short-run, Recreation-related Spending Impacts Of Sand Hollow Reservoir (In 1999 $$)

	Average Spending Per Visitor Day		
	$16.00	**$21.00**	**$26.00**
50,000 Visitor Days	$1,300,485	$1,711,080	$2,121,675
100,000 Visitor Days	$2,600,971		$4,243,351
150,000 Visitor Days	$3,901,456	$5,133,241	$6,365,027

Of the multiple outcomes presented above, the author believes that the most likely outcome is the one that is shaded in the middle of the table, or $3,422,161. It is important to note, however, that there is a probability of occurrence associated with each of the outcomes presented and that those probabilities may not be equal.

The impacts on the number of jobs created in Washington County due to short-run, recreation-related spending associated with Sand Hollow Reservoir are presented in Table 2 below:

Table 2.

Number Of Jobs Supported In Washington County Due To Short-run, Recreation-related Spending Impacts Of Sand Hollow Reservoir

	Average Spending Per Visitor Day		
	$16.00	**$21.00**	**$26.00**
50,000 Visitor Days	29.2	38.6	47.9
100,000 Visitor Days	58.5	77	95.7
150,000 Visitor Days	87.7	115.7	143.6

Once again the author believes that the number of jobs created in the short-run due to recreation-related spending will most likely be close to the shaded outcome, or about 77 jobs. The assumptions used in developing each scenario are explained in the Appendix. However, given the use patterns that have emerged for Quail Creek Reservoir, general population growth along the I-15 corridor between Cedar City and Las Vegas, and looking at the use of other state parks in the region over the past few years, combined with the increasing popularity of OHV's and water craft, these estimates could in fact be quite conservative. These impacts are more conservative in light of the fact that the impacts do not account for the spillover effects that occur in adjacent counties in Utah, Arizona and Nevada. The proposed Sand Hollow Reservoir will provide significant impact to the economy of Washington County, as well as the other regions of southwestern Utah.

Long-run Impact Results. As the population in the region grows, the risk of double-counting existing recreational demanders diminishes. As stated earlier, this study assumes that the long-run use rate will be 500,000 visitor days per year. The standard spending assumptions that were made in the short-run analysis will apply in this case as well, although that may be a conservative assumption. Once again, as incomes rise, and recreational opportunities become intrenched, proportionate spending on such activities will likely increase. However, to once again generate conservative estimates, the spending levels used in the short-run analysis will be assumed to hold in the long-run as well. Economic impact on total industry output and jobs are summarized Table 3 below:

Table 3.

**Total Annual Output And
Jobs Supported In Washington County
Due To Long-run, Recreation-related Spending Impacts
Of Sand Hollow Reservoir (In 1999 $$ where appropriate)**

	Average Spending Per Visitor Day		
	$16.00	**$21.00**	**$26.00**
Total Output ($$)	$13,004,853	$17,110,806	[illegible]
Jobs Supported	292.4	385.6	[illegible]

It is clear that in the long run, Sand Hollow Reservoir will be a major contribution to the economy of Washington County, given this set of realistic, and conservative assumptions. It is the opinion of the author of this study that the Sand Hollow Reservoir will play a vital role in the economic composition of the County, and Southwestern Utah. The author favors the higher of the Total Impact values, or those occurring under the assumption of $26 spending per visitor day. This preference is due to the fact that spending will generally increase as a percent of income in the long run as incomes rise.

Justification of Assumptions.

The range of the number of visitor days used in the short-run analysis must be lower due to complications arising from the risks associated with double-counting existing recreational users at Gunlock, Quail Creek, etc. In time, those risks fall as demand increases generally due to income growth as well as population growth. Thus, the long run visitor day level is, by definition, unduplicated visitation, and is reasonably well within the current visitation of similar parks in the State Park System. A report of park visitation is attached.

The short-run visitation numbers are more problematic. Without a full recreational use survey of potential visitors it is difficult to be sure whether there is sufficient new recreational demand to support the Sand Hollow park in an unduplicated fashion. However, given the rapid growth of both income and population in the region, and the ballooning growth of visitation at Quail Creek and others, the author has little doubt that the numbers presented are attainable in an unduplicated fashion.

Spending assumptions include the following:

1. Average visitation groups are comprised of three persons;
2. Retail trade purchases per person could be $5, $10, or $15 per day, thus generating the three spending scenarios;
3. Park entrance fees per visitor day are assumed to be $1.50;
4. Services purchases per visitor day are assumed to be $1.00;
5. County purchases of $5,100 worth of water craft or OHV's were assumed to occur for every 200th visitation group (½ of 1% of all groups), each group being comprised of three persons. This computes to $8.50 worth of OHV or water craft purchases per visitor day.

These assumptions are made in good faith, and, without external data gathering, the only question that remains is, are these assumptions reasonable? It is my opinion that these are reasonable assumptions. There is a conscious attempt on the part of the author to not inflate the impacts of the reservoir. Rather, there is a strong desire to create conservative assessments. Readers should keep in mind that trade purchases include food, gasoline, oil and other incidental items.

Characteristics of Input-Output Models.

The input-output (I-O) model used or this analysis is called IMPLAN. This model was initially developed by the USDA, Forest Service. The data set required to run the model has recently been managed by the Department of Agricultural and Applied Economics at the University of Minnesota, Twin Cities. The current manager of the data set is the Minnesota IMPLAN Group, a spinoff company from the university. The data set used in this analysis are for the year 1996. All 1999 results were generated assuming various growth factors for each

for the year 1996. All 1999 results were generated assuming various growth factors for each economic sector. Each sectoral growth factor is derived through econometric models imbedded in the IMPLAN model. Primary sources of data include those from the US Department of Census and the Internal Revenue Service.

This I-O model breaks down county economic activity into 528 industrial sectors. Each sector is assumed to be interdependent with the other sectors in the economy, in the sense that one industry's output may be another industry's input. The relative prices of inputs to outputs are assumed to be constant over time. This implies that the quantity of inputs needed to create a particular output are fixed in proportions.

Model printouts.

The following spreadsheets are the direct printouts from the IMPLAN model for each of the three visitor-day expenditure scenarios. Each run includes an estimate of Direct Effects, Indirect Effects, Induced Effects, and Total Effects. Direct Effects are the economic impacts that are related only to the change in final demand for the industries "shocked" by the researcher. Indirect Effects are the initial changes in all industries outputs that are used as inputs into the shocked industries. Induced Effects are remaining changes in output and its corresponding demand that are caused by the process as changes in demand feed back on changes in output and vice versa. The Total Effects are equal to Direct Effects + Indirect Effects + Induced Effects.

Perhaps one of the better ways to understand what this means is to think of the process as being similar to a drop of water hitting a pond. The direct effect is the initial splash, the indirect effect is the first ring away from the center, and the induced effects are all of the other concentric rings that are created.

The coding of each printout is listed in the heading as "Impact Name." Each impact scenario is simply coded. The low, med, or high means low spending, medium spending, or high spending. The number is the assumed number of visitor days. For example, "100kmed" means medium spending ($21 per visitor day) assuming the 100,000 visitor day level.

ATTACHMENTS.

Utah State Division of Parks and Recreation

1998 Visitation July - December

	July	August	Septembe	October	November	December	1997 Total	1997 To Date	1998 To Date
Anasazi	6,836	6,475	6,489	4,199	849	367	49,307	49,307	44,584
Antelope Island	64,014	72,608	34,829	28,913	16,466	7,852	264,315	264,315	362,126
Bear Lake East	15,598	13,656	6,944	2,570	1,220	1,337	38,247	38,247	56,512
Bear Lake Marina	35,479	29,732	16,925	4,402	1,819	1,657	90,227	90,227	109,497
Bear Lake Rdvs Beach	37,868	40,838	16,007	999	127	50	65,727	65,727	111,607
Camp Floyd-Stgch Inn	917	1,059	925	459	186	90	10,886	10,886	9,231
Coral Pink Sand Dunes	23,415	18,189	22,741	21,903	11,505	7,203	164,544	164,544	188,164
Dead Horse Point	22,906	22,984	21,681	15,489	4,688	2,511	185,122	185,122	170,010
Deer Creek	56,203	30,228	12,572	1,690	2,726	1,325	99,191	99,191	153,055
East Canyon	33,153	14,011	7,721	1,351	1,137	738	92,121	92,121	83,322
Edge of the Cedars	2,485	2,139	2,636	2,854	664	509	22,868	22,868	19,808
Escalante	9,299	8,569	7,664	5,255	995	876	76,514	76,514	62,264
Ft. Buenaventura	6,810	9,146	9,629	0	0	0	46,866	46,866	42,813
Fremont	15,203	14,925	11,542	13,075	5,072	2,418	99,677	99,677	105,205
Goblin Valley	4,618	4,673	6,703	5,907	1,597	414	70,829	70,829	70,860
Goosenecks	854	796	796	615	209	148	5,665	5,665	5,736
Great Salt Lake	0	0	13,335	9,000	4,000	5,000	460,989	460,989	56,585
Green River	12,387	16,599	16,993	7,194	2,859	1,447	138,107	138,107	116,471
Guntock	3,053	19,163	9,643	5,443	3,220	3,063	67,502	67,502	71,212
Huntington	15,498	12,044	3,840	1,425	525	1,155	63,193	63,193	66,099
Hyrum	6,731	9,324	5,999	3,994	3,012	3,104	48,910	48,910	54,383
Iron Mission	3,862	5,143	2,530	2,102	2,070	1,197	63,110	63,110	30,529
Jordan River	10,775	9,250	8,241	2,150	626	2,072	63,406	63,406	65,002
Jordanelle - Hallstone	92,645	61,526	14,993	6,271	1,304	247	290,225	290,225	275,427
Jordanelle - Rock Cliff	9,814	4,830	1,349	1,932	802	173	41,537	41,537	35,221
Kodachrome	7,694	7,895	9,341	5,864	1,104	654	63,958	63,958	63,380
Lost Creek	0	0	0	0	0	0	2,003	2,003	0
Millsite	9,592	7,680	3,584	1,551	689	862	47,557	47,557	48,297
Minersville	5,028	5,070	2,343	1,965	951	849	16,702	16,702	35,073
Mountain Meadow	2,317	3,086	1,518	1,261	1,242	718	41,187	41,187	19,227
Otter Creek	3,353	2,384	2,051	1,379	371	175	20,237	20,237	18,381
Palisade	47,862	35,392	43,201	23,872	9,884	8,564	102,806	102,806	271,548
Piute	2,499	1,953	1,684	1,414	532	357	29,470	29,470	19,301
Quail Creek	105,052	93,221	77,282	57,549	41,299	39,005	357,077	357,077	730,901
Red Fleet	5,488	9,000	2,269	1,500	590	230	52,905	52,905	35,965
Rockport	39,562	56,721	25,221	10,091	6,465	5,257	275,571	275,571	210,015
Scofield	27,826	19,262	9,620	4,323	1,582	2,723	103,603	103,603	96,755
Snow Canyon	66,052	73,049	54,425	62,661	45,504	35,805	646,204	646,204	674,498
Starvation	33,324	20,841	14,162	2,246	1,131	744	98,689	98,689	101,652
Steinaker	10,903	9,202	5,078	2,008	680	494	66,714	66,714	51,104
Territorial	5,461	3,433	2,736	1,348	1,803	1,965	39,766	39,766	32,016
This Is The Place	0	0	0	0	0	0	550,763	550,763	64,509
Utah Field House	21,609	19,340	6,951	3,573	4,301	6,526	90,043	90,043	98,520
Utah Lake	114,710	102,686	84,689	30,250	17,575	16,900	705,073	705,073	734,995
Veterans Memorial	2,019	2,453	1,991	1,649	1,540	1,271	22,711	22,711	22,231
Wasatch Mountain	153,966	149,333	124,002	77,886	22,329	30,174	886,137	886,137	880,669
Willard Bay	109,524	41,174	28,529	8,770	471	350	276,059	276,059	300,702
Yuba	17,515	15,132	11,137	2,141	737	868	70,319	70,319	68,316
TOTALS	1,281,679	1,106,218	774,841	452,513	228,457	199,444	7,184,639	7,184,639	6,943,780

Output Impact

May 06, 1999

IMPACT NAME: 50klow MULTIPLIER: Type II
C:\Program Files\IMPLAN Professional\models\Washington.iap

Description	Direct*	Indirect*	Induced*	Total*	Deflator
1 Agriculture	5	1,120	1,726	2,851	1.07
28 Mining	0	357	473	830	1.10
48 Construction	0	9,028	6,359	15,387	1.06
58 Manufacturing	427	11,539	21,550	33,516	1.06
433 TCPU	491	26,331	39,471	66,293	1.04
447 Trade	638,740	20,780	90,204	749,724	1.03
456 FIRE	423	31,438	80,012	111,872	1.02
463 Services	32,608	74,650	131,209	238,468	1.06
510 Government	66,995	6,273	8,277	81,545	1.05
516 Other	0	0	0	0	1.02
	739,689	181,517	379,279	1,300,485	

1999 Dollars

Employment Impact

May 06, 1999

IMPACT NAME: 50klow MULTIPLIER: Type II
C:\Program Files\IMPLAN Professional\models\Washington.iap

Description	Direct*	Indirect*	Induced*	Total*
1 Agriculture	0.0	0.1	0.1	0.1
28 Mining	0.0	0.0	0.0	0.0
48 Construction	0.0	0.1	0.1	0.2
58 Manufacturing	0.0	0.1	0.2	0.3
433 TCPU	0.0	0.2	0.4	0.6
447 Trade	16.8	0.5	2.4	19.7
456 FIRE	0.0	0.2	0.6	0.8
463 Services	0.7	1.7	3.0	5.5
510 Government	1.7	0.2	0.2	2.1
516 Other	0.0	0.0	0.0	0.0
	19.2	3.1	6.9	29.2

*Number of Jobs

Output Impact

May 06, 1999

IMPACT NAME: 50kmed MULTIPLIER: Type II
C:\Program Files\IMPLAN Professional\models\Washington.iap

Description	Direct*	Indirect*	Induced*	Total*	Deflator
1 Agriculture	5	1,509	2,251	3,765	1.07
28 Mining	0	456	617	1,073	1.10
48 Construction	0	11,439	8,294	19,732	1.06
58 Manufacturing	427	15,364	28,108	43,899	1.06
433 TCPU	491	35,015	51,482	86,988	1.04
447 Trade	873,369	27,929	117,653	1,018,951	1.03
456 FIRE	423	41,978	104,360	146,761	1.02
463 Services	32,608	99,453	171,137	303,199	1.06
510 Government	67,590	8,328	10,795	86,713	1.05
516 Other	0	0	0	0	1.02
	974,913	241,471	494,697	1,711,080	

*1999 Dollars

Employment Impact

May 06, 1999

IMPACT NAME: 50kmed MULTIPLIER: Type II
C:\Program Files\IMPLAN Professional\models\Washington.iap

Description	Direct*	Indirect*	Induced*	Total*
1 Agriculture	0.0	0.1	0.1	0.2
28 Mining	0.0	0.0	0.0	0.0
48 Construction	0.0	0.1	0.1	0.2
58 Manufacturing	0.0	0.1	0.2	0.4
433 TCPU	0.0	0.3	0.5	0.8
447 Trade	22.9	0.7	3.1	26.8
456 FIRE	0.0	0.3	0.8	1.1
463 Services	0.7	2.3	3.9	6.9
510 Government	1.7	0.2	0.3	2.2
516 Other	0.0	0.0	0.0	0.0
	25.4	4.2	9.0	38.6

*Number of Jobs

Output Impact

May 06, 1999

IMPACT NAME: 50khigh MULTIPLIER: Type II
C:\Program Files\IMPLAN Professional\models\Washington.iap

Description	Direct*	Indirect*	Induced*	Total*	Deflator
1 Agriculture	5	1,898	2,776	4,679	1.07
28 Mining	0	555	760	1,316	1.10
48 Construction	0	13,849	10,229	24,078	1.06
58 Manufacturing	427	19,189	34,666	54,282	1.06
433 TCPU	491	43,698	63,493	107,683	1.04
447 Trade	1,107,999	35,077	145,103	1,288,179	1.03
456 FIRE	423	52,519	128,708	181,649	1.02
463 Services	32,608	124,256	211,065	367,930	1.06
510 Government	68,184	10,383	13,314	91,880	1.05
516 Other	0	0	0	0	1.02
	1,210,137	301,424	610,114	2,121,675	

*1999 Dollars

Employment Impact

May 06, 1999

IMPACT NAME: 50khigh MULTIPLIER: Type II
C:\Program Files\IMPLAN Professional\models\Washington.iap

Description	Direct*	Indirect*	Induced*	Total*
1 Agriculture	0.0	0.1	0.1	0.2
28 Mining	0.0	0.0	0.0	0.0
48 Construction	0.0	0.2	0.1	0.3
58 Manufacturing	0.0	0.2	0.3	0.4
433 TCPU	0.0	0.4	0.6	1.0
447 Trade	29.1	0.9	3.8	33.8
456 FIRE	0.0	0.4	0.9	1.3
463 Services	0.7	2.8	4.8	8.4
510 Government	1.7	0.3	0.3	2.3
516 Other	0.0	0.0	0.0	0.0
	31.6	5.2	11.1	47.9

*Number of Jobs

Output Impact

May 06, 1999

IMPACT NAME: 100klow MULTIPLIER: Type II
C:\Program Files\IMPLAN Professional\models\Washington.iap

Description	Direct*	Indirect*	Induced*	Total*	Deflator
1 Agriculture	10	2,240	3,451	5,701	1.07
28 Mining	0	715	945	1,660	1.10
48 Construction	0	18,057	12,717	30,774	1.06
58 Manufacturing	853	23,077	43,101	67,032	1.06
433 TCPU	983	52,662	78,941	132,586	1.04
447 Trade	1,277,480	41,560	180,407	1,499,447	1.03
456 FIRE	845	62,876	160,023	223,744	1.02
463 Services	65,217	149,301	262,419	476,936	1.06
510 Government	133,990	12,547	16,553	163,090	1.05
516 Other	0	0	0	0	1.02
	1,479,378	363,034	758,559	2,600,971	

*1999 Dollars

Employment Impact

May 06, 1999

IMPACT NAME: 100klow MULTIPLIER: Type II
C:\Program Files\IMPLAN Professional\models\Washington.iap

Description	Direct*	Indirect*	Induced*	Total*
1 Agriculture	0.0	0.1	0.2	0.3
28 Mining	0.0	0.0	0.0	0.0
48 Construction	0.0	0.2	0.2	0.4
58 Manufacturing	0.0	0.2	0.3	0.5
433 TCPU	0.0	0.5	0.7	1.2
447 Trade	33.6	1.1	4.7	39.4
456 FIRE	0.0	0.5	1.2	1.6
463 Services	1.5	3.4	6.0	10.9
510 Government	3.4	0.3	0.4	4.1
516 Other	0.0	0.0	0.0	0.0
	38.5	6.3	13.7	58.5

*Number of Jobs

Output Impact

May 06, 1999

IMPACT NAME: 100kmed MULTIPLIER: Type II
C:\Program Files\IMPLAN Professional\models\Washington.iap

Description	Direct*	Indirect*	Induced*	Total*	Deflator
1 Agriculture	10	3,018	4,501	7,530	1.07
28 Mining	0	912	1,233	2,146	1.10
48 Construction	0	22,877	16,587	39,465	1.06
58 Manufacturing	853	30,727	56,217	87,797	1.06
433 TCPU	983	70,029	102,964	173,976	1.04
447 Trade	1,746,739	55,858	235,306	2,037,903	1.03
456 FIRE	845	83,957	208,719	293,522	1.02
463 Services	65,217	198,906	342,275	606,398	1.06
510 Government	135,179	16,656	21,590	173,425	1.05
516 Other	0	0	0	0	1.02
	1,949,826	482,941	989,393	3,422,161	

*1999 Dollars

Employment Impact

May 06, 1999

IMPACT NAME: 100kmed MULTIPLIER: Type II
C:\Program Files\IMPLAN Professional\models\Washington.iap

	Description	Direct*	Indirect*	Induced*	Total*
1	Agriculture	0.0	0.2	0.2	0.4
28	Mining	0.0	0.0	0.0	0.0
48	Construction	0.0	0.3	0.2	0.5
58	Manufacturing	0.0	0.2	0.5	0.7
433	TCPU	0.0	0.6	0.9	1.6
447	Trade	45.9	1.5	6.2	53.5
456	FIRE	0.0	0.6	1.5	2.1
463	Services	1.5	4.6	7.8	13.9
510	Government	3.4	0.4	0.5	4.4
516	Other	0.0	0.0	0.0	0.0
		50.8	8.4	17.9	77.1

*Number of Jobs

Output Impact

May 06, 1999

IMPACT NAME: 100khigh MULTIPLIER: Type II
C:\Program Files\IMPLAN Professional\models\Washington.iap

Description	Direct*	Indirect*	Induced*	Total*	Deflator
1 Agriculture	10	3,797	5,551	9,359	1.07
28 Mining	0	1,110	1,521	2,631	1.10
48 Construction	0	27,698	20,457	48,155	1.06
58 Manufacturing	853	38,377	69,333	108,563	1.06
433 TCPU	983	87,396	126,986	215,365	1.04
447 Trade	2,215,998	70,155	290,205	2,576,358	1.03
456 FIRE	845	105,038	257,416	363,299	1.02
463 Services	65,217	248,512	422,131	735,859	1.06
510 Government	136,368	20,765	26,628	183,761	1.05
516 Other	0	0	0	0	1.02
	2,420,274	602,848	1,220,228	4,243,351	

*1999 Dollars

Employment Impact

May 06, 1999

IMPACT NAME: 100khigh MULTIPLIER: Type II
C:\Program Files\IMPLAN Professional\models\Washington.iap

Description	Direct*	Indirect*	Induced*	Total*
1 Agriculture	0.0	0.2	0.3	0.5
28 Mining	0.0	0.0	0.0	0.0
48 Construction	0.0	0.3	0.2	0.6
58 Manufacturing	0.0	0.3	0.6	0.9
433 TCPU	0.0	0.8	1.2	2.0
447 Trade	58.2	1.8	7.6	67.7
456 FIRE	0.0	0.8	1.9	2.6
463 Services	1.5	5.7	9.7	16.9
510 Government	3.4	0.5	0.7	4.6
516 Other	0.0	0.0	0.0	0.0
	63.2	10.5	22.1	95.7

*Number of Jobs

Output Impact

May 06, 1999

IMPACT NAME: 150klow MULTIPLIER: Type II
C:\Program Files\IMPLAN Professional\models\Washington.iap

Description	Direct*	Indirect*	Induced*	Total*	Deflator
1 Agriculture	16	3,360	5,177	8,552	1.07
28 Mining	0	1,072	1,418	2,490	1.10
48 Construction	0	27,085	19,076	46,161	1.06
58 Manufacturing	1,280	34,616	64,651	100,547	1.06
433 TCPU	1,474	78,993	118,412	198,879	1.04
447 Trade	1,916,220	62,341	270,611	2,249,171	1.03
456 FIRE	1,268	94,314	240,035	335,616	1.02
463 Services	97,825	223,951	393,628	715,404	1.06
510 Government	200,985	18,820	24,830	244,635	1.05
516 Other	0	0	0	0	1.02
	2,219,067	544,551	1,137,838	3,901,456	

*1999 Dollars

Employment Impact

May 06, 1999

IMPACT NAME: 150klow MULTIPLIER: Type II
C:\Program Files\IMPLAN Professional\models\Washington.iap

Description	Direct*	Indirect*	Induced*	Total*
1 Agriculture	0.0	0.2	0.3	0.4
28 Mining	0.0	0.0	0.0	0.0
48 Construction	0.0	0.3	0.2	0.6
58 Manufacturing	0.0	0.3	0.5	0.8
433 TCPU	0.0	0.7	1.1	1.8
447 Trade	50.3	1.6	7.1	59.1
456 FIRE	0.0	0.7	1.7	2.4
463 Services	2.2	5.1	9.0	16.4
510 Government	5.1	0.5	0.6	6.2
516 Other	0.0	0.0	0.0	0.0
	57.7	9.4	20.6	87.7

*Number of Jobs

Output Impact

May 06, 1999

IMPACT NAME: 150kmed MULTIPLIER: Type II
C:\Program Files\IMPLAN Professional\models\Washington.iap

Description	Direct*	Indirect*	Induced*	Total*	Deflator
1 Agriculture	16	4,527	6,752	11,295	1.07
28 Mining	0	1,369	1,850	3,218	1.10
48 Construction	0	34,316	24,881	59,197	1.06
58 Manufacturing	1,280	46,091	84,325	131,696	1.06
433 TCPU	1,474	105,044	154,446	260,964	1.04
447 Trade	2,620,108	83,786	352,959	3,056,854	1.03
456 FIRE	1,268	125,935	313,079	440,282	1.02
463 Services	97,825	298,359	513,412	909,596	1.06
510 Government	202,769	24,984	32,386	260,138	1.05
516 Other	0	0	0	0	1.02
	2,924,739	724,412	1,484,090	5,133,241	

*1999 Dollars

Employment Impact

May 06, 1999

IMPACT NAME: 150kmed MULTIPLIER: Type II
C:\Program Files\IMPLAN Professional\models\Washington.iap

Description	Direct*	Indirect*	Induced*	Total*
1 Agriculture	0.0	0.2	0.3	0.6
28 Mining	0.0	0.0	0.0	0.0
48 Construction	0.0	0.4	0.3	0.7
58 Manufacturing	0.0	0.4	0.7	1.1
433 TCPU	0.0	1.0	1.4	2.4
447 Trade	68.8	2.2	9.3	80.3
456 FIRE	0.0	0.9	2.3	3.2
463 Services	2.2	6.8	11.8	20.8
510 Government	5.1	0.6	0.8	6.6
516 Other	0.0	0.0	0.0	0.0
	76.2	12.6	26.9	115.7

*Number of Jobs

Output Impact

May 06, 1999

IMPACT NAME: 150khigh MULTIPLIER: Type II
C:\Program Files\IMPLAN Professional\models\Washington.iap

Description	Direct*	Indirect*	Induced*	Total*	Deflator
1 Agriculture	16	5,695	8,327	14,038	1.07
28 Mining	0	1,665	2,281	3,947	1.10
48 Construction	0	41,547	30,686	72,233	1.06
58 Manufacturing	1,280	57,566	103,999	162,845	1.06
433 TCPU	1,474	131,095	190,480	323,048	1.04
447 Trade	3,323,997	105,232	435,308	3,864,537	1.03
456 FIRE	1,268	157,557	386,124	544,948	1.02
463 Services	97,825	372,768	633,196	1,103,789	1.06
510 Government	204,552	31,148	39,942	275,642	1.05
516 Other	0	0	0	0	1.02
	3,630,412	904,273	1,830,342	6,365,027	

*1999 Dollars

Employment Impact

May 06, 1999

IMPACT NAME: 150khigh MULTIPLIER: Type II
C:\Program Files\IMPLAN Professional\models\Washington.iap

Description	Direct*	Indirect*	Induced*	Total*
1 Agriculture	0.0	0.3	0.4	0.7
28 Mining	0.0	0.0	0.0	0.0
48 Construction	0.0	0.5	0.4	0.9
58 Manufacturing	0.0	0.5	0.8	1.3
433 TCPU	0.0	1.2	1.8	3.0
447 Trade	87.3	2.8	11.4	101.5
456 FIRE	0.0	1.1	2.8	4.0
463 Services	2.2	8.5	14.5	25.3
510 Government	5.2	0.8	1.0	7.0
516 Other	0.0	0.0	0.0	0.0
	94.8	15.7	33.2	143.6

*Number of Jobs

Output Impact

May 06, 1999

IMPACT NAME: 500klow MULTIPLIER: Type II
C:\Program Files\IMPLAN Professional\models\Washington.iap

Description	Direct*	Indirect*	Induced*	Total*	Deflator
1 Agriculture	52	11,200	17,255	28,507	1.07
28 Mining	0	3,573	4,727	8,300	1.10
48 Construction	0	90,284	63,587	153,871	1.06
58 Manufacturing	4,266	115,387	215,504	335,158	1.06
433 TCPU	4,913	263,309	394,707	662,929	1.04
447 Trade	6,387,399	207,803	902,035	7,497,236	1.03
456 FIRE	4,226	314,379	800,116	1,118,721	1.02
463 Services	326,083	746,503	1,312,094	2,384,680	1.06
510 Government	669,951	62,733	82,766	815,450	1.05
516 Other	0	0	0	0	1.02
	7,396,890	1,815,170	3,792,793	13,004,853	

*1999 Dollars

Employment Impact

May 06, 1999

IMPACT NAME: 500klow MULTIPLIER: Type II
C:\Program Files\IMPLAN Professional\models\Washington.iap

Description	Direct*	Indirect*	Induced*	Total*
1 Agriculture	0.0	0.6	0.9	1.4
28 Mining	0.0	0.0	0.0	0.1
48 Construction	0.0	1.1	0.8	1.8
58 Manufacturing	0.0	0.9	1.7	2.7
433 TCPU	0.0	2.4	3.6	6.1
447 Trade	167.8	5.5	23.7	196.9
456 FIRE	0.0	2.3	5.8	8.1
463 Services	7.5	17.1	30.0	54.6
510 Government	16.9	1.6	2.1	20.6
516 Other	0.0	0.0	0.0	0.0
	192.3	31.5	68.7	292.4

*Number of Jobs

Output Impact

May 06, 1999

IMPACT NAME: 500kmed MULTIPLIER: Type II
C:\Program Files\IMPLAN Professional\models\Washington.iap

Description	Direct*	Indirect*	Induced*	Total*	Deflator
1 Agriculture	52	15,092	22,506	37,650	1.07
28 Mining	0	4,562	6,166	10,728	1.10
48 Construction	0	114,387	82,937	197,324	1.06
58 Manufacturing	4,266	153,637	281,084	438,987	1.06
433 TCPU	4,913	350,146	514,820	869,879	1.04
447 Trade	8,733,696	279,288	1,176,531	10,189,514	1.03
456 FIRE	4,226	419,785	1,043,598	1,467,608	1.02
463 Services	326,083	994,532	1,711,374	3,031,989	1.06
510 Government	675,896	83,279	107,952	867,127	1.05
516 Other	0	0	0	0	1.02
	9,749,133	2,414,707	4,946,967	17,110,806	

*1999 Dollars

Employment Impact

May 06, 1999

IMPACT NAME: 500kmed MULTIPLIER: Type II
C:\Program Files\IMPLAN Professional\models\Washington.iap

Description	Direct*	Indirect*	Induced*	Total*
1 Agriculture	0.0	0.8	1.1	1.9
28 Mining	0.0	0.0	0.1	0.1
48 Construction	0.0	1.4	1.0	2.4
58 Manufacturing	0.0	1.2	2.3	3.5
433 TCPU	0.0	3.2	4.7	8.0
447 Trade	229.4	7.3	30.9	267.7
456 FIRE	0.0	3.1	7.6	10.7
463 Services	7.5	22.8	39.2	69.4
510 Government	17.1	2.1	2.7	21.9
516 Other	0.0	0.0	0.0	0.0
	254.1	41.9	89.6	385.6

*Number of Jobs

Output Impact

May 06, 1999

IMPACT NAME: 500khigh MULTIPLIER: Type II
C:\Program Files\IMPLAN Professional\models\Washington.iap

Description	Direct*	Indirect*	Induced*	Total*	Deflator
1 Agriculture	52	18,984	27,757	46,793	1.07
28 Mining	0	5,551	7,604	13,155	1.10
48 Construction	0	138,490	102,287	240,777	1.06
58 Manufacturing	4,266	191,887	346,663	542,816	1.06
433 TCPU	4,913	436,982	634,932	1,076,828	1.04
447 Trade	11,079,991	350,773	1,451,026	12,881,790	1.03
456 FIRE	4,226	525,190	1,287,079	1,816,494	1.02
463 Services	326,083	1,242,560	2,110,653	3,679,296	1.06
510 Government	681,841	103,826	133,138	918,805	1.05
516 Other	0	0	0	0	1.02
	12,101,373	3,014,242	6,101,140	21,216,755	

999 Dollars

Employment Impact

May 06, 1999

IMPACT NAME: 500khigh MULTIPLIER: Type II
C:\Program Files\IMPLAN Professional\models\Washington.iap

Description	Direct*	Indirect*	Induced*	Total*
1 Agriculture	0.0	1.0	1.4	2.4
28 Mining	0.0	0.0	0.1	0.1
48 Construction	0.0	1.7	1.2	2.9
58 Manufacturing	0.0	1.5	2.8	4.4
433 TCPU	0.0	4.0	5.8	9.9
447 Trade	291.1	9.2	38.1	338.4
456 FIRE	0.0	3.8	9.4	13.2
463 Services	7.5	28.5	48.3	84.3
510 Government	17.2	2.6	3.4	23.2
516 Other	0.0	0.0	0.0	0.0
	315.8	52.3	110.5	478.7

*Number of Jobs